



**TWELFTH ANNUAL CONVENTION OF  
INDIAN SOCIETY FOR VETERINARY SURGERY  
AND NATIONAL SYMPOSIUM ON  
"ROLE OF EXPERIMENTAL SURGERY  
IN ANIMAL HEALTH AND PRODUCTION"**

**(7-9 DECEMBER, 1988)  
SOUVENIR**



**DIVISION OF EXPERIMENTAL MEDICINE & SURGERY  
INDIAN VETERINARY RESEARCH INSTITUTE  
IZATNAGAR-243 122 (U.P.)**

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**SOUVENIR**

*Smith*  
*2/3/89*

*Dr. A. K. Mitra, Ph.D.*  
*Professor of Head Surgery*  
*Veterinary College*  
*Banbansagar 751003*



**DIVISION OF EXPERIMENTAL MEDICINE & SURGERY  
INDIAN VETERINARY RESEARCH INSTITUTE  
IZATNAGAR-243 122 (U. P.)**



कृषि मंत्री  
भारत सरकार  
नई दिल्ली-११०००१  
MINISTER OF AGRICULTURE  
GOVERNMENT OF INDIA  
NEW DELHI-110001

October 31, 1988

## MESSAGE



I am pleased to note that Indian Veterinary Research Institute has been chosen by the Indian Society for Veterinary surgery as the venue for holding 12th Annual Convention from 7th to 9th December, 1988.

Scientists in the Division of Experimental Medicine and Surgery, I believe, are doing an outstanding job in innovating newer techniques in experimental surgery for solving managerial problems in clinical surgery and establishing animal models for allied research. They have long way to go to solve the problems of livestock owners. Services of veterinary surgeons are well appreciated, through extension camps, by the farmers.

I am sure that intensification of research in veterinary surgery will minimise losses due to various irreparable diseases in animals.

I convey my best wishes to the organisers and participants for the success of the conference and symposium.

( Bhanu Lal )



राज्य मंत्री  
कृषि अनुसंधान और शिक्षा  
( कृषि मंत्रालय )  
भारत सरकार  
नई दिल्ली - 110001

MINISTER OF STATE  
AGRICULTURAL RESEARCH AND EDUCATION  
( MINISTRY OF AGRICULTURE )  
GOVERNMENT OF INDIA  
NEW DELHI-110001

1st November 1988

## MESSAGE



It gives me an immense pleasure to learn that the 12th Symposium of the Indian Society for Veterinary Surgery is being organized at the Premier Institute of Veterinary Research and Education, the Indian Veterinary Research Institute, Izatnagar from 7-9 Dec, 1988.

The role of surgery in animal care is well known when a farmer regains his animal's utility after minor intervention. Now operations like stringhalt, rumenotomy, caesarean section, thoracotomy, fracture repair and calculi etc. etc. are being done at farmers door. This would have not been possible without the development of regional anaesthesia, easier techniques within available resources. I hope the symposium will aid in training of field veterinarians who will be in a better position to transfer advance techniques in the augmentation of animal production.

I am sure, convention has an adequate interaction with surgeons working in agricultural universities. I wish all success for the symposium.

( HARI KRISHNA SHASTRI )

ARUN KUMAR SINGH  
Minister for Animal  
Husbandry, Fisheries &  
Dairy Development, U. P.



COUNCIL HOUSE

Dated : Nov., 1988

## MESSAGE



I congratulate the organizing committee of the 12th convention of Indian Society for Veterinary Surgery for its foresightedness in having its convention in Premier Veterinary Institute of India, IVRI. The rightly selected theme "The role of experimental Surgery in Animal Health and Production" will cater the needs for the continuing education of veterinary surgeons and innovating newer techniques.

I am sure the occasion will be utilized for understanding surgical problems keeping in view the benefits for the livestock owners in rural areas.

I wish the conference all the success.

( Sd. Arun Kumar Singh )



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**Dr. R. M. ACHARYA**  
Deputy Director General  
(Animal Sciences)

भारतीय कृषि अनुसंधान परिषद्  
कृषि भवन, डा० राजेन्द्र प्रसाद मार्ग, नई दिल्ली-110091  
INDIAN COUNCIL OF AGRICULTURAL RESEARCH  
Krishi Bhawan, Dr. Rajendra Prasad Road,  
New Delhi - 110001

Dated the 3rd Nov., 1988

## MESSAGE



I am extremely happy to learn that Indian Society for Veterinary Surgery is organising its 12th convention at IVRI from 7th to 9th December, 1989. We are all proud of the achievements made by the Indian Veterinary Research Institute in the areas of animal health and its contribution to manpower training, production of diagnostics and vaccines which have helped in improving production of Indian Livestock.

The services of veterinary surgeons is well appreciated by our livestock owners in saving the life and maintaining utility of their animals. I am confident that the papers presented in the symposium will be of basic and applied use in development of veterinary surgery and allied fields in medicine.

I convey my best wishes to the organisers and the participants for the success of the Conference and symposium.

(Sd. R. M. Acharya)

Dr. Ram Janam Singh  
Director,  
Animal Husbandry,  
Uttar Pradesh.



## MESSAGE

I feel delighted to learn that 12th Symposium of Indian society for veterinary surgery is going to be held at Indian Veterinary Research Institute, Izatnagar from 7-9th Dec., 1988. The State of Uttar Pradesh is fortunate to have this premier Institute in its boundries and accordingly this State has been benifited the most. Surgical intervention provide instentaneous relief to animal and impact of professional service on the livestock

owner. Needless to say that surgical camps have been most useful in augmenting animal production and improving socio-economic status of the small farmers.

I am sure that newer techniques introduced in convention will further help for better management and understanding of surgical conditions.

I wish a big success to this convention and congratulate the organisers for selecting the theme on this vital field.

(Sd. Ram Janam Singh )




## INDIAN VETERINARY RESEARCH INSTITUTE

Izatnagar, (U.P.)—243 122.

November 10, 1988

### MESSAGE



I am delighted to know that the Executive Committee of the Indian Society for Veterinary Surgery at its 11th Annual Convention at Guwahati had decided to hold its 12th Convention at IVRI, Izatnagar, from December 7-9. It is a matter of great pleasure for this Institute to host this important symposium with the befitting theme **The Role of Experimental Surgery in Animal Health and Production.**

Though in its developmental stages itself the Division of Experimental Medicine and Surgery could make commendable strides in the field of Veterinary Surgery and Radiology, still much has to be achieved by this young division. While

extending my sincere welcome to all the participants who would be arriving at this National Institute and India's only Central Veterinary University for taking part in the deliberations, I shall be grateful if they kindly excuse me for shortcomings, if any, felt during the course of their stay.

I am certain that the deliberations during this seminar will go a long way in recommending surgical practices which will minimize sufferings of the livestock and lead to higher productivity in animals.

I sincerely wish success for the 12th Symposium of the Indian Society for Veterinary Surgery being held at this premier Institute.

  
( P. N. Bhat )



# INDIAN SOCIETY FOR VETERINARY SURGERY

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★★★

## Indian Veterinary Research Institute

The Indian Veterinary Research Institute (IVRI) came into existence in 1889 as Imperial Bacteriological Laboratory at Pune on the recommendation of "Indian Cattle Plague Commission". The laboratory was shifted to Mukteswar in the Kumaon Hills of UP in 1893. The campus had the privilege of being visited and scientific contributions made by Dr. Alford Lingard (1890); Dr. Robert Koch; R. Pfeiffer and G. Gaffky (1897). Major campus of Izatnagar was established in 1913. In 1925 the name of the Imperial Bacteriological laboratory was designated as Imperial Veterinary Serum Institute and till 1931, the work at Mukteswar campus was limited to three sections; viz. Pathology, Serology, and Protozoology. In 1936, the Imperial Veterinary Serum Institute, Izatnagar became the Biological Production Unit and was renamed as Imperial Veterinary Research Institute. The institute acquired its present name Indian Veterinary Research Institute after independence in 1947.

The Institute presently comprises of three main campuses - Izatnagar, Mukteswar and Bangalore, three regional stations at Palampur, Calcutta and Srinagar, 21 research divisions, 4 major livestock production research projects and a post graduate college of Animal science which was conferred the status of Deemed University on 16-11-1983.

Recently, National Biotechnology Board has approved a Biotechnology centre for carrying out research on DNA Recombinant Technology, Hybridoma Technology and Embryo Transfer Technology.

One of the major achievements of the institute has been in the prevention and control of certain important animal diseases by providing suitable immunobiologicals.

Historically, the convention happens to fall in the centenary year of this National Institute.

## Division Of Experimental Medicine And Surgery

This Division came into existence in 1975 during the 4th Five Year Plan to undertake various activities pertaining to teaching, research and extension programmes in the disciplines of Medicine and Surgery. Presently, it is one of the highly equipped Division of the national Institute.

Though in developmental stage, the Division has made several strides in the field of Veterinary Surgery and Radiology. Some of the salient achievements in the field of veterinary surgery are: use of bone plates prepared from bovine horn for fracture fixation, evaluation of different techniques of intestinal anastomosis, radiographic evaluation of coronary circulation in different species of animals and studies on hyperglycaemia. Another important contribution of the Division includes the development of the suitable animal models for gastric ulcers, obstructive jaundice, hypercholesterolemia, secondary hyperglycaemia hepatitis etc.

The Division is imparting post-graduate teaching and research for M. V. Sc. and Ph. D. degrees in Veterinary Medicine and Surgery. Field veterinarians and officers of different services are given practical training during National Diploma courses. Additionally, the Division also organises short term training courses for field veterinarians to keep them abreast with the latest development and technology.

## THEME PAPER

### ROLE OF EXPERIMENTAL SURGERY IN ANIMAL HEALTH AND PRODUCTION.

Dr. R. P. S. Tyagi,  
Member, A. S. R. B.,  
Kishi Anusandhan Bhawan,  
New Delhi.

Historically among the ancient peoples, Sumerians, Egyptians, Hindus, Chinese and Jews are known to possess a plethora of medical knowledge. In addition to science of medicine, Hindus and Egyptians also mastered the art of Surgery. In India, Sushruta practiced and taught surgery as back as 800 B. C. His monumental treatise on Surgery, Sushruta Samhita, established him as the father of Indian Surgery and the first surgeon to systematize surgery by dividing it into separate fields. He is known as the originator of plastic surgery, cataract operation laparotomy and vesicle lithotomy. He used different types of vegetables viz. Jack fruit, various types of cucurbits etc., to train surgeons in incising surfaces without damaging underlying structures. Perhaps, that is the first record of Experimental Surgery. As the time passed by, the objects and objectives of experimental surgery changed with the advances made in the field of medicine. Surgeons started using animals instead of vegetables for better understanding of pathophysiological essence of the operation, elaboration of new operative technique and development of newer operative methods/techniques. It is now commonly agreed that a new operative intervention acquires the right to be put into practice only after it has been thoroughly tested to determine its permissibility, the pathophysiological shifts in the organism and methods for compensating for the lost function.

As the 19th century ushered in 20th, tremendous experimental surgery was undertaken and nowadays, Experimental Surgery has become an integral part of research carried out in different disciplines of veterinary and medical sciences.

#### PHYSIOLOGICAL STUDIES :

Historically, operative surgery can be divided into three basic types. These are the repair of wounds, the extirpation of diseased organs or tissue and reconstructive

surgery. These categories have more fundamental significance than the division of surgery on a regional or systemic basis, as is seen in surgical practice with its many specialities. To these three categories, two more developments of the twentieth century must be added : physiologic surgery and replacement surgery. The surgical method underlying Experimental Surgery is important in physiological research. Various types of operations are employed to understand the normal physiology of various organs and body function.

Physiologic surgery requires knowledge of the functions of the systems of the body and their interrelations, because its beneficial results depend upon altering normal physiologic mechanisms for the general good of body function. The disease is not attacked directly by physiologic operation, because either the etiology of the disease is not known or the lesion can not be operated upon directly. Physiologic operations are usually palliative but often they are curative from the practical stand point of view. Sympathectomy for certain type of vascular disease and portal hypertension are operations in this category. Operations for duodenal ulcer are the type that take advantage of altering body function for its effect. Obviously, present day operations for duodenal ulcers do not attack the cause of the disease but suffice to control gastric acidity. The field of physiologic surgery is an ever increasing one, fed by knowledge gained in the experimental surgical laboratory.

An old method for studying the functions of the internal organs, mainly gut, is the creation of fistulae and artificial passages, which allow the secretion of these organs to be collected at any time for examination. Fistulas of stomach, pancreas, bile duct, intestine, urinary bladder, salivary gland, etc. are being used since long. These are used for sampling of the contents of the different organs for bacteriological examination, chemical analysis and pH determination. Fistulas of digestive tracts are also used for injecting materials into various parts of digestive tract, for recording digestive tract pressure changes associated with gut motility pattern and to undertake electromyographic studies of gut.

Cannulation of arteries and veins are valuable adjuncts to blood sampling and making direct blood pressure recordings. In neurological studies, operations like decerebration, cannulation of cerebrospinal tract and implantation of brain electrodes, etc. are valuable in studies of reflexes, blood brain barrier and other experiments

Involving cerebrospinal fluid changes, nuclei, ganglia, etc., is a widely used method for studying the role of various parts of the nervous system.

Experimental surgery has also been used to study the seasonal and behavioral changes in different species of animals. The pineal gland has been implicated as an integral part of the "biological clock" mechanism regulating the seasonal and diurnal physiological changes that take place in animals. The profound normal seasonal variations observed in some of the species suggested that removal of pineal body in these species might cause departure from normal sequences.

Replacement surgery is unique field not only because worn or diseased organs or parts can be reconditioned or replaced by living tissue or by inserting plastic, metal or fabrics but more important because in this field, the surgeon defies basic surgical principles. Replacement of the abdominal aorta by plastic fabrics after aneurysmectomy is a good example of this type of surgery. More fascinating and somewhat promising is tissue and organ transplantation.

#### PHARMACOLOGICAL STUDIES :

Experimental surgery is valuable adjunct in pharmacological research. Effects of different pharmacological substances on different organs are studied by isolated organ preparations. Cannulation of different vessels and cerebrospinal fluid tract are helpful in studies related to blood brain barrier of different drugs and their concentration in blood and cerebrospinal fluid. Various depletion operations such as Bursectomy, Thymectomy, Adrenalectomy, Orchedectomy, Pancreatectomy etc. are performed for metabolic studies and evaluation of different pharmacological compounds.

#### REPRODUCTIVE PHYSIOLOGY:

In experimental animals, exploratory laparotomy is used for monitoring ovarian activity. Abdominal fistula using plastic windows was also attempted for visualizing ovarian activity. However, rapid growth of peritoneal like deposits on the inner side of window made this attempt a failure. The transfer of embryo from one animal to another has been of interest to research workers for many years. In cattle, embryo-transfer has an interesting history and is one of the most rapidly changing area involving reproductive physiology. Until mid 1970, surgical embryo collections were most successful, however, of late, nonsurgical collection has been

adopted by most of the groups. Although non-surgical transfer of embryos is the need for future, yet surgical collection and transfer of embryos has its own place in the research related to basic understanding of reproductive physiology.

Operations like ovariectomy, orchidectomy, hypophysectomy, etc. are used for studies related to hormonal assay.

#### **PATHOLOGICAL STUDIES :**

Experimental surgery has made splendid advances in the most complicated field, that is of modelling surgical pathological conditions. Models of valvular heart diseases, arterio-venous fistulas, shock, collapse syndromes, compression of the spinal cord and the brain, intestinal obstruction, myocardial infarction, etc. have contributed much to the current understanding of the pathophysiology of similar pathological conditions in man and animals. Such creation of experimental models of pathological processes and diseases is essential in perceiving the essence of various types of surgical pathology and interpreting the etiology and pathogenesis of diseases and the possible means of treating them. At the same time no satisfactory models of diseases have yet been created in certain branches of pathology. The great number of means for producing the picture of inflammatory diseases of the gall bladder, pancreas, etc. probably indicates our lack of knowledge of the true pathogenesis of such pathological conditions.

The important advances in the art and science of surgery during the medieval period were the establishment of secular education and the divorce of the practice of medicine from the church and church sanction to scientific investigation. Dissection of the human body was permitted officially by Pope Sixtus IV towards the end of fifteenth century, which created a firm basis to build the medical future.

#### **IMMUNOLOGICAL STUDIES :**

Immunological studies require surgical intervention for experimental removal of thymus in foetus or new born, removal of bursa in birds or spleen in animals. Models have been developed which are either impaired for their humoral or cellular immune response. Experimentally models have been developed which are deficient in immunocompetent cells and even immunocompetent cells can be collected from peritoneal cavity by fistula in peritoneum or subcutaneous tissue. Cannulation of

thoracic duct has been very much practiced for collection of lymphocytes. The cannulation of lymphatics of intestinal network has made it possible to study the behaviour of the cells in antigenic stimulation of Peyer's patches. In recent years, experimental research on organ and tissue transplantation has developed rapidly. The advances made in this direction include: elaboration of transplantation techniques for almost all vitally important organs, experimental demonstration of the efficacy of methods for suppressing immunity and selection according to antigenic and genetic traits as well as research into non-infectious immunity.

#### **NUTRITIONAL STUDIES :**

Fistulation and Cannulation of different parts of gut are used in nutritional studies. Cannulation of oesophagus is used for collection of milk in young calves, grazing and eating behaviour of sheep and cattle, measuring mixed saliva secretion and to study certain salivary enzyme such as lipase. Uses of rumen and abomasal fistula and pouches are varied. They are used for sampling of ingesta and also for injecting materials into these parts of digestive tract. Duodenal and ileal fistula and intestinal bypass canulas are valuable for sampling at different points of G I tract and for stopping the flow of ingesta for a short time for absorption studies.

The uses of Experimental Surgery in biological research are immense and it is difficult to enumerate all of them at one place. However the aforesaid discussion indicates that today researchers require the combined knowledge of many fields. In fact, the knowledge required can rarely, if ever, be the domain of a single individual. For this reason during the past decade, research has evolved from the individual to the team of research workers from the different fields. As such surgeons rarely can simply be involved with advancing operative techniques but instead must also be capable of adopting the highly sophisticated basic science ideas and techniques to the solution of different problems. To perform effectively, this role demands knowledge and techniques far beyond those prescribed in strictly clinically oriented training programmes. Therefore, the person who can take the dramatic biological development emerging in the laboratories from basic research and carry them across the bridge to improve the health and production of animals holds the future of veterinary surgery.

Today, Surgeons make important scientific contributions to medicine by their clinical and laboratory research. Education and training in surgery today put special emphasis on collateral reading and instructions in the basic medical sciences. Many



## Theme Paper

surgical residents spend time not only in surgical research laboratory but in basic science laboratories. Perhaps the great difference between the practice of surgery and internal medicine is found in the responsibility which the surgeon takes in transgressing the animal body by an elective type of operation, one calculated to improve the patients' health. Since there is always some risk to operation and anaesthesia, the responsibility in recommending certain elective operations is great. Surgery requires the disciples to have high principles, personal integrity and compassion for their patients.

The oxford university dictionary defines surgery as "The art or practice of treating injuries, deformities and other disorders by manual operation or instrumental appliances". The definition is archaic in that it fails to mention the great nonoperative labour of surgery which is concerned with the restoration and maintenance of operation. This latter aspect of surgical knowledge and practice is the surgery of modern times.

It is a matter of great satisfaction that this premier Institute has introduced the Division of Experimental Medicine and Surgery in the year 1975. Since then, the scientists of this Division has contributed a lot in the field of Experimental Surgery by developing different animal models for the advancement of knowledge in disease diagnosis and animal production. □□□

# ***ABSTRACTS***

Session I

Experimental Surgery.

Chairman : Dr. O. Ramakrishna

Rapporteur : Dr. Jit Singh

1121. GOAT AS AN ANIMAL MODEL FOR STUDIES ON OCCLUSIVE CORONARY DISEASE :

A. K. Bhargava, O. P. Gupta and A. K. Das,  
Division of Experimental Medicine & Surgery,  
IVRI, Izatnagar, UP-243 122.

The present study was conducted to evaluate goat as an experimental model for occlusive coronary disease by ligating different branches of coronary artery. Segmental ligation of coronary demonstrated individual variation of myocardial revitalization in goats. The important factor for goats to serve as better model for studies on occlusive coronary disease is that ligation of coronary involves minimal handling of myocardial tissues as the coronary arteries are more superficially located than other experimental animals; thus, avoids left ventricular premature beats on electrocardiogram taken during post-ligation period. Occlusion of left diagonal artery seems to be more meaningful than common circumflex artery as it is devoid of physiological anastomoses between right and left coronaries. The ligation of diagonal artery is more fatal than that of circumflex artery.

1122. ANIMAL MODEL FOR PERIPHERAL OCCLUSIVE ARTERIAL DISEASE- AN EXPERIMENTAL STUDY IN CALVES.

A. K. Bhargava, C. S. Celly, and G. R. Singh,  
Division of Experimental Medicine & Surgery,  
IVRI, Izatnagar-UP-243 122.

Attempts were made to establish an animal model for peripheral occlusive arterial disease in twelve cow calves by ligation of unilateral or bilateral metacarpal/me-

tatarsal arteries. Post ligation signs were not simulating to clinical signs visualized in severe vasospasms, vasoconstriction or chronic occlusive disease pattern. Temporary ischemic signs were well tolerated/compensated by the opening of physiological shunts. Angiography helped in the visualization of such collaterals in such cases. Aneurysmal changes were also demonstrated in interdigital arteries. Based upon the study clinical cases of arterio-venous shunts were also diagnosed and treated by ligation of supplying vessels.

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### 1.03. A TECHNIQUE OF SPINAL CORD COMPRESSION IN DOGS.

**P. T. Khambatta** and **C. C. Wakankar**,  
Bombay Veterinary College, Parel,  
Bombay-400 012.

Fifteen mature healthy dogs, free from neurological deficit, were used in the present study. The vertebral canal was approached after removing articular process of 2nd and 3rd lumbar vertebrae. The Foley Catheter was then inserted into the vertebral canal to the prefix mark. Mechanical compression of the spinal cord was achieved by inflating the balloon within the canal.

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### 1.04. EXPERIMENTAL HOMOGENOUS LAMELLAR KERATOPLASTY IN BULL CALVES.

**B. Sarma** and **S. C. Pathak**,  
Department of Surgery & Radiology,  
College of Veterinary Science, AAU,  
Khanapara, Guwahati,

Homogenous lamellar keratoplasty was tried in ten apparently healthy bull calves. Side of the donor graft was same with the recipient bed. Catgut was used to suture the graft. Edge to edge suture was found to be suitable. Antibiotic was used to combat infection. Synechia was prevented by using atropine which also served as cycloplegic. Following healing, steriod was used to make the cornea

transplant. Vision was regained after 30 days in 80% cases of the homogenous lamellar keratoplasty.

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#### EXPERIMENTAL OMASOTOMY IN BUFFALO CALVES.

D. P. Asin and S. C. Ojha,  
Department of Clinics  
College of Veterinary Science & A. H.,  
Gujarat Agricultural University,  
Sardar Krushinagar-385 506

Surgical approach for the correction of omasal impaction in experimental buffalo calves is discussed.

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#### EXPERIMENTAL CRANIOTOMY IN RABBITS : A TOOL FOR EVALUATION OF MATERIALS.

S. Bhaskara Rao and V. V. Radhkrishnan,  
Division of Pathology, SCTIMST,  
Thiruvandrum.

Rabbit (*Oryctolagus cuniculus*) has been widely used as an experimental model for the evaluation of materials, but the literature on its applicability in experimental surgical procedures is much less. In order to evaluate the efficacy and neurotoxicity of Chytosans, a trial was made by conducting experimental craniotomy in rabbits.

The detailed anaesthetic protocol, a comparative evaluation of thiopentone sodium and nembutol and the perioperative procedure of experimental craniotomy will be discussed in detail and the results observed from about 30 Rabbits will be presented.

This experimental surgical protocol can even be followed for a variety of procedures like creation of sub-arachnoid haemorrhages, cranial shunt procedures, monitoring CVP, etc.

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**1.07. STUDIES ON REDISTRIBUTION OF BLOOD FLOW WITH ACUTE FEMORAL ARTERIAL OCCLUSION IN CANINES.**

**P. K. Samanta** and **B. N. Kolay**,  
Department of Physiology,  
University of Calcutta.

The effects of acute femoral arterial occlusion upon redistribution of blood flow over leg muscle were studied in dogs. Occlusion of the femoral artery at the femoral triangle caused redistribution of blood flow immediately after the ligation through the sub-branches of the internal iliac artery as well as through the anatomically existing collateral circulatory channels. The findings imply that there is a direct relationship between collateral gluteal circulation and femoral collateral circulation.

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**1.08. CYSTOMETRY IN NORMAL AND PARTIALLY CYSTECTOMISED DOGS.**

**T. B. Sen** and **D. B. Mukherjee**,  
Department of Surgery & Radiology,  
Faculty of Vety. & Animal Science,  
Bidhan Chandra Krishi Vishwa Vidyalaya,  
Mohanpur, Dist-Nadia (W. B.)

Cystometric measurement was done in eight normal and eight partially cystectomised dogs using simple mercury manometer under general anaesthesia. The apparatus used for the present series of the study consisted of a mercury manometer which could be connected to the indwelling urinary bladder catheter by a connecting rubber tube. An adjustable clamp was placed on the catheter to regulate the flow of

normal saline into, and from the bladder. In this experiment pressures were recorded both during the stagewise filling and emptying of the bladder. No undesirable fluctuation in the mercury column, caused by detrussor smooth muscle contractions or by the contraction of abdominal muscle, was observed. In control measurements (normal bladder), almost a smooth curve of intra vesical pressure, that gradually ascended from starting point of  $\angle 4$  mm Hg to an upper level of 12-56 mm Hg depending on size of the bladder and on the volume of fluid, was noticeable. At the stage within 100 to 200 ml of introduction of fluid in all cases, both in the normal and post operative cystometrograms, a sudden steep rise in the cytometric curve occurred. During withdrawal phase the curve was gradually descending.

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#### 1029 CYSTO-COLOSTOMY-URETHRAL BY-PASS IN YOUNG MALE CALVES.

K. Ramaswami, Dewan Muthu Mohammed,  
D. Archibald and R. Govinda Rao,  
Department of Surgery and Radiology,  
Madras Veterinary College, Madras.

The Urethral obstruction was created in six animals by ligating the Urethra at post scrotal site. Obstruction was relieved by Cysto-Colostomy. The BUN and creatinine values increased significantly after urethral ligation. Though there was significant reduction after correction, these values did not reach the preligation levels at 48 hours post correction.

The anastomosis between colon and bladder was perfect except in one animal. Skiagrams of barium enema revealed no passage of barium into the bladder, which confirmed no faecal contamination. Contrast radiography with Conray 420 revealed that there was no passage of urine from bladder into the colon till micturition impulse occurred.

Histopathological studies at the anastomosed site revealed a perfect union between colon and bladder, and infiltration of few neutrophils and mononuclear cells

were observed in the submucosal area. Cysto-colostomy may be a better method of giving a permanent solution for recurrent urethral obstruction.

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#### 1.10. ROLE OF IMMUNOCONGLUTININ IN IMMUNE PROTECTION OF EXPERIMENTAL HERNIOPLASTY OF DIAPHRAGM IN BUFFALO CALVES.

R. W. Ashtorkar, M. B. Gujar and A. P. Bhokre  
College of Veterinary and Animal Sciences,  
Marathwada Agricultural University, Parbhani 431 402

Experimental studies were planned to ascertain the role of immunoglobulin (IK) in immune protection of induced diaphragmatic defect in buffalo calves. The IK activity was significantly reduced from 3rd to 7th post-operative day in buffalo calves transplanted with preserved homogeneous diaphragm, peritoneum and prolene mesh, while it was significantly increased on 3rd day and decreased on 7th post-operative day in buffalo calves transplanted with preserved homogeneous urinary bladder. The IK titres returned normal on 14th or 21st day in all hernioplasty calves. Calves of control group did not show significant variation in IK activity throughout the study.

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#### 1.11. STUDY OF CLINICAL SIGNS AND SYMPTOMS DURING EXPERIMENTAL UROPERITONEUM AND AFTER TREATMENT IN BUFFALO CALVES.

P. T. Jadhao, A. P. Bhokre, and S. M. Usturge.  
College of Veterinary Sciences,  
Marathwada Agricultural University, Parbhani 431 402

Experimental Uroperitoneum was created in 30 male buffalo calves. All the experimental calves developed the typical uraemic symptoms which were noted during the disease stage. The heart rate, respiratory rate and rectal temperature were also noted during the disease stage and treatment period. The various therapeutic procedures consisted of cystorrhaphy, release of urethral obstruction



along with the intravenous fluid therapy in one group and peritoneal dialysis using different dialysing solutions in 3 groups. One group was kept as control.

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### **1.12. TRACHEAL FISTULATION FOR REPEATED BRONCHOSCOPY IN SHEEP AND GOAT.**

**C. S. Celly and G. R. Singh,**  
Division of Experimental Medicine and Surgery,  
IVRI, Izatnagar-243122

Tracheal fistulation was performed in 25 sheep and 15 goats for repeated bronchoscopy and collection of bronchial washings for pathological studies. A conical plastic canula was used to maintain the diameter of the tracheal fistula so as to facilitate the entry of fiberoptic end of bronchoscope. The trachea was exteriorized and an opening was created by splitting either 6th or 7th tracheal ring. The plastic canula was fitted in this opening and was secured with skin by 4-6 interrupted mattress sutures applied all around the canula using Black Braided Silk No. 2. The bronchoscopic examination was done daily for 45 days post operatively. During this period, no complications like asphyxiation was noticed.

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### **1.13. INTRADUODENAL CANULATION IN SHEEP AND GOATS.**

**G. R. Singh and C. S. Celly,**  
Division of Experimental Medicine & Surgery,  
IVRI, Izatnagar-243122

Intraduodenal canulation was undertaken in 15 sheep and 5 goats without any intra or post operative complication. The pylorus was exteriorized by opening the abdomen at right ventrolateral region parallel to the last rib. The duodenal wall was punctured with 13 gauge hypodermic needle and a catheter was advanced

through the puncture, deep into the duodenal lumen for a distance of about 4 inches. The catheter was secured in situ by a purse-string suture. The remaining length of the catheter was secured at many sites viz wall of abomasum and abdominal muscles. The distal end of the catheter was passed through an artificially created subcutaneous tunnel, and was then exteriorized from skin at right paralumbar fossa. The catheters were observed for 25 days during which they could be used for infecting materials without any complication.

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#### 1.14. PREPARATION OF BUFFALO BONE GELATIN AND ITS EVALUATION AS OSTEOINDUCTIVE AGENT IN RABBIT- PRELIMINARY STUDY.

S. K. Maiti, B. N. Kowale and G. R. Singh,  
Division of Experimental Medicine & Surgery,  
Indian Veterinary Research Institute,  
Izatnagar, UP-243 122.

Fresh bones were collected from slaughtered buffalo and freed of adhering soft-tissue. Small pieces (1-2") were defatted by dipping in hot water at 50°C for four hours. Hydrochloric acid (5%) was used to demineralise bones for ten days. The decrease in pH was compensated by addition of 6 N HCl daily. The spongy bones were dipped in 5% suspension of lime to hydrolyse the cross-linkages for two weeks. Extraction of gelatin was carried out at 60°C, at pH 4.5, for two hours. The extract was diluted, centrifuged, filtered and dried in stainless steel trays at 60°C in the oven.

The bone gelatin was packed (100 mg) in commercially available gelatin capsule and sterilized under ultra-violet light. One capsule was then implanted intra-muscularly (gluteus medius) each in six rabbits. Roentgenograms taken after 30 days of implantation demonstrated the radiopaque foci at the site of implantation.

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**ACID-BASE AND BLOOD GAS ALTERATIONS IN TRIGONAL-COLONIC AND TRIGONAL-PROCTAL DIVERSION IN GOAT.**

S. E. NIGAM, I. V. Megha and G. R. Singh,  
Division of Experimental Medicine & Surgery,  
Indian Veterinary Research Institute,  
Carnage-243 122, UP.

Trigonal-colonic and Trigonal-proctal urinary diversion were performed in twelve nondescript, adult goats and their acid-base and blood-gases at different intervals were estimated. The pH, did not vary significantly and remained alkaline. The  $PCO_2$ , total carbondioxide ( $TCO_2$ ), actual bicarbonate ( $HCO_3$ ), standard bicarbonate (SBC), base-excess (BE) and standard base excess (SBE) increased upto two weeks post-diversion and there after returned to normal. The  $PO_2$  and oxygen saturation (SAT) remained slightly lower than normal. In general, the experimental animals tended to maintain a normal acid-base and blood gas status, or had tendency towards marginal metabolic alkalosis during post-urinary diversion period which is contrary to acid-base alterations found in non-ruminants and in human beings, with anemia.



Chairman : Dr. J. M. Nigam

Rapporteur : Dr. S. K. Pant

2.01. A NOTE ON EMERGENCIES AND COMPLICATIONS ASSOCIATED WITH POST ANAESTHETIC MANAGEMENT IN CANINES.

A. K. Srivastava and R. J. Singh,  
I/C Canine Therapy,  
State Vety. Polyclinic, Lucknow,  
Director, Animal Husbandry,  
Uttar Pradesh, Lucknow.

The emergencies and complications associated with post anaesthetic management due to mechanical problems of general anaesthesia recorded in canines during 1986-88 were post operative hypotension, post operative respiratory failure and post operative excitement.

The post operative hypotension was due to drug induced/central vasomotor depression / post surgical haemorrhage / cardiac arrhythmias / inadequate volume replacement / hypothermia, which were corrected by early recognition, maintaining constant body temperature and adequate fluid therapy during surgery.

The post operative respiratory failure was due to hypoventilation because of mechanical splinting associated with pain or bandages / drug induced respiratory depression / hypocapnea / CO<sub>2</sub> narcosis / post intubation spasm or glottic oedema, other respiratory obstructions, which were managed by removing obvious cause, supporting ventilation / increasing oxygen flow/using analeptics or analgesics respectively.

The post operative excitement was due to rapid emergence from barbiturate anaesthesia / inadequate premedication prior to anaesthesia.

**202 GLYCERYL GUAIACOLATE-CHLORAL HYDRATE-KETAMINE ANAESTHESIA IN BUFFALOES.**

**S. N. Sharma and Amresh Kumar,**  
Department of Surgery & Radiology,  
College of Veterinary Sciences,  
G. B. Pant University of Agriculture & Technology,  
Pantnagar-263 145, UP

A combination of 5% solution of glyceryl guaiacolate, 4% chloral hydrate and ketamine 300 mg was used intravenously to effect to produce surgical anaesthesia. The duration of anaesthesia lasted for  $26.25 \pm 0.85$  minutes and complete recovery occurred in  $45.50 \pm 0.50$  minutes. The onset of anaesthesia was quick and the quantity required to produce anaesthesia was 50 mg/kg glyceryl guaiacolate, 60 mg/kg chloral hydrate and 1.5 mg/kg ketamine hydrochloride. Respiratory and heart rates significantly increased after GG-chloral hydrate-ketamine administration. There was a slight decrease in central venous pressure and arterial blood pressure. There was no significant change in serum proteins, serum electrolytes ( $\text{Na}^+$ ,  $\text{K}^+$  and  $\text{Cl}^-$ ), however, a significant hyperglycemia was observed after their administration. A slight respiratory alkalosis was seen after administration of GG-Chloral hydrate-ketamine combination. Standard bicarbonate and base excess remained within normal physiological limits. These drugs combinations were tolerated well and no complications were observed.

**203 ELECTROSTIMULATION OF ACUPOINT VG-26 TO COUNTERACT THIOBARBITURATE DEPRESSION IN DOGS.**

**Amresh Kumar and Awadh Bihari,**  
Department of Surgery & Radiology,  
College of Veterinary Sciences,  
G. B. Pant University of Agriculture & Technology,  
Pantnagar-263 145 UP

The stimulation of acupoint VG-26 affectively counteracted the cardiopulmonary depressive effects of thiobarbiturate anaesthesia in dogs. Its stimulation caused a

significant increase in heart and respiratory rates and blood pressure, ( $P \leq 0.05$ ). It also significantly improved the respiratory acidosis caused by thiobarbiturate administration. A significant decrease in  $\text{Pa-CO}_2$  and arterial pH was observed after stimulation of acupoint VG-26. It shortened the duration of anaesthesia and hastened complete recovery. The stimulation of acupoint VG-26 can be used to counteract the depressive effects of thiobarbiturate anaesthesia in clinical patients.

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#### 2.04 XYLAZINE-KETAMINE ANAESTHESIA IN LARGE ANIMAL ORTHOPAEDIC SURGERY-AN EXPERIMENTAL STUDY.

L. B. Sarkate and A. K. Bhargava, G. R. Singh,  
Division of Experimental medicine & Surgery,  
Indian veterinary Research Institute,  
Izatnagar.

The effect of xylazine and Ketamine as a general anaesthetics was evaluated in the repair of tibial fracture with double bone plating in 8 bull calves. Atropine sulphate was given intramuscularly 1/2 hour prior to induction of general anaesthesia. General anaesthesia was induced by intravenous injection of xylazine (0.2 mg/kg) and maintained by ketamine given intravenously at the dose rate of 5 mg/kg body weight. Additional ketamine was also given in the same dose rate for maintenance of general anaesthesia as and when required during surgery.

Induction of anaesthesia was smooth and early and initial duration of anaesthesia was 25 minutes. Longer duration of anaesthesia was maintained upto 1.5 hour by subsequent intravenous injection of ketamine alone. There was decrease in respiratory, increase in heart rate following intravenous administration of ketamine without much variation in body temperature. Blood glucose level during anaesthesia was found increased. Electro-cardiography during anaesthesia revealed increase in duration and amplitude of T wave. Sick sinus syndrome, sudden apnea and death following fast administration of ketamine was recorded in one calf. The combination of xylazine and ketamine resulted in excellent muscle relaxation required for reduction and fixation of tibial fracture.

## EVALUATION OF GLYCERYL GUAIACOLATE AS A MUSCLE RELAXANT IN CAMELS (*CAMELUS DROMEDERIUS*)

Za Slegh, Khalid Benhaj,

M. M. Huanl, Rama Kumar V. and

S. S. Dodhi.

Departments of Surgery and Obstetrics and Physiology Division of Veterinary Medicine,

Al-Fateh University of Medical Sciences,

Tripoli, and \*Tripoli Zoological gardens,

Tripoli, Libya.

Studies were conducted in four healthy camels (*Camelus dromedarius*) weighing 230 to 350 Kg. The effects of 2% and 5% of glyceryl guaiacolate were studied in pilot trials. Subsequently concentrations of 7.5% and 10% were evaluated in three trials each, each camel being used for more than one trial. The results with 2.5% solution were not satisfactory. The concentration of 5% (200 mg/kg) produced satisfactory muscle relaxation of 20 minutes duration. Concentration of 7.5% ( $\bar{x}$  dose 135 mg/kg) produced good muscle relaxation while the same was excellent when a 10% solution ( $\bar{x}$  dose 156.3 mg/kg) was used. The animals gave a sedated look but there was no analgesia. Both induction and recovery were smooth. The duration of effect with 7.5% and 10% solution was 15-20 minutes and 20-25 min., respectively. Animals were able to stand and walk after 45 minutes of the administration of the drug. There was no evidence of haemolysis or haemoglobinuria.

There was evidence of AV-block in two trials each with 7.5% and 10% concentration of glyceryl guaiacolate. Packed cell volume, haemoglobin, total erythrocytic count, total leucocytic count, neutrophiles, mean corpuscular volume, mean corpuscular haemoglobin and mean corpuscular haemoglobin concentration remained unaffected. Lymphocytes decreased significantly at 30 and 45 minutes. The values of plasma urea and creatinine and various electrolytes were not affected. The pattern of changes with 7.5% and 10% concentration were same.

The use of higher concentrations of glyceryl guaiacolate in camels reduced the induction time and dose of drug while degree of muscle relaxation was increased.

2.06 **CARDIOPULMONARY STATUS DURING DIAZEPAM CHLORAL HYDRATE AND HALOTHANE ANAESTHESIA IN CALVES.**

H. S. Bains and K. K. Mirakhur,  
Department of Surgery & Radiology,  
Punjab Agricultural University,  
Ludhiana-141 004.

Cardio-pulmonary status was studied in 15 male cross bred calves anaesthetized with a combination of diazepam and chloral-hydrate in two different orders of administration, both given intravenously and subsequent maintenance with halothane for thoracotomy. The effects on heart rate and central venous pressure were comparable when diazepam was followed by chloral hydrate or chloral hydrate was followed by diazepam. The respiratory depression, as evidenced by the effects on respiratory rate, tidal volume and minute volume, was more when chloral hydrate was used after diazepam. Acidosis was observed in both the orders of administration of induction agents. But it was less pronounced during chloral hydrate followed by diazepam anaesthesia. Hypoxaemia and decreased oxygen utilization were observed in both the combinations, however, these were less by chloral hydrate followed by diazepam. Halothane anaesthesia, subsequent to chloral hydrate-diazepam induction did not affect the cardio-respiratory dynamics appreciably. The effects observed were mainly due to mechanical effects of IPPV. Assisted ventilation, to some extent, was able to correct the acidosis observed due to chloral hydrate-diazepam-halothane anaesthesia.

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2.07. **CLINICAL AND BIOCHEMICAL EFFECTS OF DIAZEPAM, CHLORAL HYDRATE AND HALOTHANE ANAESTHESIA IN CALVES.**

S. H. Bains and K. K. Mirakhur,  
Department of Surgery & Radiology,  
Punjab Agricultural University,  
Ludhiana-141 004.

A combination of diazepam and chloral hydrate (both given intravenously) to attain basal anaesthesia, for subsequent halothane maintenance during thoracotomy,



was carried out in 15 male cross bred calves. Administration of chloral hydrate followed by diazepam was found better than diazepam followed by chloral hydrate for a similar duration of anaesthesia on the basis of a similar duration of anaesthesia on the basis of a comparatively lesser dosage used and quicker recovery from anaesthesia. The increase in the activity of plasma enzymes was comparable in both the combinations. No appreciable change in plasma electrolytes and haematology was observed. Maintenance of anaesthesia by halothane, in animals induced with chloral hydrate followed by diazepam, was observed to be satisfactory for thoracic surgery. The activity of plasma enzymes was also increased by halothane anaesthesia but the plasma electrolytes and haematological parameters were not affected.

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#### A SIMPLE METHOD OF ANAESTHESIA FOR CASTRATION OF THE HORSE UNDER FIELD CONDITION.

P. K. Samanta.

Department of Surgery & Radiology,

Faculty of Vety. & Animal Sciences,

Bidhan Chandra Krishi Vishwa Vidyalaya,

Mohanpura, Nadia. (W.B.)

Anaesthesia for castration of the horse by open method, was done by inducing local analgesia of the spermatic cord and the testicle with 10 ml of 2% Lignocaine hydrochloride injection at the neck of the scrotum near the external inguinal ring along with the pre-anaesthetic premedications namely, atropine sulphate, pentazocaine lactate and triflupromazine hydrochloride injections. Two temporary ligatures were given about 2.5 cm apart after grasping the scrotum near its neck. A total 10 ml of the same local anaesthetic solution was injected within the substance of the spermatic cord. After a lapse of 10 minutes castration was done. The effect of anaesthesia was determined by relaxation of the spermatic cord and the testicle which did not retract during manipulation. No difficulty was found during the operation and recovery from anaesthesia. The method was followed in 5 horses with success. It may be concluded that this anaesthetic technique has potential as an effective procedure under field condition.

**2.09 CLINICAL AND HAEMATOLOGICAL EFFECTS OF DIAZEPAM-KETAMINE COMBINATION IN CANINE SURGICAL PATIENTS.**

S. K. Pandey, I. J. Sharma and S. K. Tiwari,  
College of Veterinary Science and Animal Husbandry,  
Jawaharlal Nehru Krishi Vishwa Vidyalyaya,  
Jabalpur.

In fifty canines operated for venereal granuloma, episiotomy, orchidectomy, ovariectomy, ear haematoma, abdominal hernia, limb amputation, abdominal perforation, intramedullary pinnig, extirpation of eye ball, buccal papilloma, cystotomy, urethrotomy and anal gland sinus, three different combinations of atropine sulphate, diazepam, and ketamine were tried. In treatment I, 0.65 mg of atropine sulphate IM, 3 mg/kg of diazepam and 5 mg/kg of ketamine I V were used. In treatment II and III, the dose of diazepam and atropine was the same but ketamine was used at the rate of 8 mg and 10 mg/kg body weight respectively.

The onset of anaesthesia was within 6 to 8 minutes in treatment I, 5 to 6 minutes in treatment II, and 5 to 7 minutes in treatment, III. The duration of anaesthesia was 15 to 20 minutes, I, II and III respectively. The duration of anaesthesia could be prolonged by 10 to 15 minutes by injecting additional dose of ketamine at the rate of 3 mg/kg body weight. The effect of anaesthesia was predominated by sluggish eye lid reflexes, absence of corneal reflexes, fixation of eye ball in the centre and loss of pedal reflexes. The depressed respiration, increased heart rate and hypothermia were the other characteristic symptoms of the onset of anaesthesia. Tongue remains out of buccal cavity even after animal recovered from anaesthesia. The anaesthesia provided excellent muscle relaxation and post anaesthetic sleep existed for an average duration of 185 minutes. Recovery was signed by occasional crying, lifting of head and return of normal reflexes. No variations were recorded in RBC, Hb, PCV and ESR. But the TLC and differential leucocyte count recorded certain variations.

### HAEMATOLOGICAL AND BIOCHEMICAL RESPONSE TO SUB-ARACHNOID USE OF CERTAIN ANALGESICS IN BUPIVACAINE INDUCED SPINAL ANALGESIA IN GOATS.

S. K. Tripathi, S. K. Pandey, M. K. Bhargava and M. A. Quadri,

College of Veterinary Science and Animal Husbandry,

Jawahar Lal Nehru Krishi Vishwa Vidyalaya,

Jalpaiguri.

Six healthy male goats were subjected to four different treatments at an interval of 8 days. In treatment I bupivacaine (1 mg/kg) was injected into subarachnoid space while in treatment II, III and IV buprenorphine (0.3 mg/animals), pethidine (30 mg/animal) and pentozocine (30 mg/animal) were injected following bupivacaine. Blood and CSF samples were collected at variable intervals for the estimation of different haemato-biochemical attributes.

Differential leucocyte count of blood and CSF revealed significant decrease in neutrophils while no neutrophils could be observed in CSF. Significant increase in blood lymphocytes was observed in all the four treatment, yet CSF lymphocytes remain unaffected. Blood eosinophils remain normal and no eosinophils were seen in CSF. Monocytes were significantly increased in blood and CSF and basophils were rare in their appearance.

Blood and CSF glucose and total proteins showed significant increase while serum inorganic phosphorus, magnesium and chloride decreased significant. CSF inorganic phosphorus and magnesium remained unaffected but chloride was significantly decreased in all the treatments. Serum and CSF sodium and potassium did not show any change during the entire experimental period. □□□

Session III

Orthopaedic Surgery—I

Chairman : Dr. S. S. Rathor

Rapporteur : Dr. D. S. Chandra

3.01 EXPERIMENTAL INDUCTION OF OSTEOMYELITIS IN DOGS.

A. C. Varshney, Harpal Singh and R. S. Gupta,  
College of Veterinary Sciences,  
G. B. Pant University of Agriculture and Technology,  
Pantnagar-263145. (Distt-Nainital)

Osteomyelitis was induced in forty-five male dogs by inoculating hemolytic strain of *Staphylococcus aureus* alone into the tibial marrow cavity. Clinical, radiological and bacteriological studies were conducted to evaluate the progress of disease upto 15 weeks. Clinical signs consisted of localized soft tissue swelling, pain, pyrexia and lameness which later developed into open wound with purulent exudation. Predominant radiographic features were extensive periosteal reaction, cortical lysis, new bone formation, frequent development of sequestrum and formation of localized abscess pockets in advanced cases. Bacteriological examination of infected tibia of all dogs showed positive culture for *Staphylococcus aureus*.

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3.02. EVALUATION OF THERAPEUTIC REGIMENS IN OSTEOMYELITIS :  
A BIOCHEMICAL STUDY.

A. C. Varshney, Harpal Singh, Amresh Kumar,  
Prem Prakash and S. P. Singh,  
G. B. Pant University of Agriculture and Technology,  
Pantnagar (Nainital)-263 145.

Osteomyelitis was induced by injecting hemolytic strain of *Staphylococcus aureus* into tibial marrow cavity of 45 male dogs divided into 5 groups of 9 animals each.

received: no treatment (group I); parenteral oxytetracycline therapy (group II); parenteral oxytetracycline with local collagen (group III); surgical curettage alongwith parenteral oxytetracycline and local irrigation with tetracycline solution (group IV) and treatment given to group IV alongwith collagen (group V). Three dogs of group I served as healthy control. Venous blood was collected before and after 10 days and 3, 6, 9, 12 and 15 weeks of induction (group I) or treatment (group II to V) of osteomyelitis for estimation of alkaline phosphatase, calcium and inorganic phosphorus.

The level of serum alkaline phosphatase and calcium were increased with the progression of the disease, whereas, the level of inorganic phosphorus was decreased. Following treatment, serum alkaline phosphatase value started declining till 3rd week but again increased significantly from 6th to 9th week. Thereafter, the values were near normal. An abrupt decline in serum calcium and rise in serum inorganic phosphorus levels were observed upto 9th post-therapy week in all treated groups of animals and subsequently these values returned towards normal limits. These changes were more appreciable in animals under therapeutic regimen with enriched collagen as one of the ingredients.

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### 333. FIXATION OF ARTIFICIAL LIMB IN CATTLE.

Abdul Ghani and P. E. Kulkarni,  
Faculty of Veterinary Science,  
P. K. V; Akola - 444104

An indiginous cow heifer aged about 2 years 6 month, had compound fracture at lower middle shaft of right large metatarsal bone, with about fifteen days old contaminated wounds. Fixation of fracture was tried first by applying bovine horn plates, it remained unsuccessful. The affected limb was amputated leaving a stump below the hock. Surgical wounds healed up satisfactorily by antiseptic dressings.

Keeping in view that the cow-heifer should not become a burden to the owner and that it should be utilized for breeding purposes either through artificial insemi-

nation or embryo transfer technique, the artificial limb at cheaper cost was designed and fixed to the amputated leg. The cow heifer can easily walk up to grazing fields.

The arrangement for adjustment of the length of artificial limb according to the growth of the cow heifer was made.

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**3.04. HORN PLATE—A SUBSTITUTE FOR THE REPAIR OF TIBIAL FRACTURE IN BULL CALVES—AN EXPERIMENTAL STUDY.**

L. B. Sarkate, G. R. Singh and A. K. Bhargava  
Division of Experimental Medicine & Surgery,  
Indian Veterinary Research Institute,  
Izatnagar-243122 UP.

Twelve healthy bull calves of 6 month to one year age, divided into two group of 6 animals in each was used for the repair of tibial fracture. In group I, two heavy duty stainless steel plates and in group II two horn plates were used to immobilize the experimentally created tibial fracture without any external support. Callus formation was observed earlier in group I, but evaluation of fracture healing was difficult as compare to group II, because of heavy density metal plates covering the two sides of bone. At one month, the horn plates were intact in all animals while in group II, bending of plate was observed in one animal. The animals started using the test limb on the next day of bone plating in both the groups while animals remained lame for one week post-operatively. From this study, it can be concluded that cheap and easily available horn plates can be used as a substitute for the immobilization / fixation of tibial fracture in bull calves weighing upto 150 kg.

**225. AN EXPERIMENTAL STUDY ON ENTIRE SEGMENT CORTICAL BONE GRAFTING ON TIBIA**

**By:** E. S. Singh, K. Chawla, S. K. Singh, S. Gehlot, T. K. and D. Krishnamurthy,  
Dept. of Vety. Surgery, HAU,  
Hissar.

Experimental studies were conducted on 36 goats which were divided into three sub-groups A, B and C. In each group, 12 goats were used for the evaluation of autogenous, homogenous and heterogenous cortical bone grafts respectively for filling the experimentally created defect in tibia. The fate of these grafts were evaluated on the basis of clinical, radiographical & histopathological observations at varying intervals after grafting.

Results are discussed.

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**226. USE OF PVC ( POLYVINYL CHLORIDE ) PIPE FOR THE EXTERNAL IMMOBILIZATION OF METACARPAL AND METATARSAL FRACTURES IN EXPERIMENTAL COW CALVES.**

**By:** Nishir Singh, Kuldip Singh, S. K. Chawla,  
T. K. Gehlot, R. S. Bisla and D. Krishnamurthy,  
Department of Vety. Surgery and Radiology, HAU,  
Hissar.

Fractures of metacarpal and metatarsal bones were created with the help of blunt blow under general anaesthesia in twelve experimental cow calves aged 1 year 8 month to 2 years. The fractures occurred at different sites i. e. upper third, midshaft or lower third of the bones. After immobilizing the fractures with the help of bamboo splints for a day, the fracture site was immobilized with only one 6 inch plaster bandage and after proper padding with wool cotton and bandages the limbs were fitted into PVC pipe of suitable upto the level of knee/hock joints.

Results are discussed.

### 3.07. USE OF OXYTETRACYCLINE LABELLING OF BONE IN THE EVALUATION OF BONE GRAFTS IN CALVES.

B. Parsaalli Gaj Raj Singh and P. R. Vanamayya,  
Division of Experimental Medicine & Surgery,  
IVRI, Izatnagar-243 122, U. P.

Technique of oxytetracycline labelling of bone was used for the evaluation of different types of bone grafts in calves. Oxytetracycline dihydrate was injected intramuscularly at the dose rate of 35-40 mg/kg body weight seven days before sacrificing the animal. The grafted segments of the bone were collected after sacrificing the animals and transverse sections (3-4 mm thick) including the grafted area were cut with help of heck saw. The sections were then grinded to 20 micron thickness using different grades sand papers. Final grinding was over hone under moderate pressure using slow circular motion. The section were kept wet with water during entire procedure. The sections were washed and observed under u. v. light using flourescent microscope.

Oxytetracycline dihydrate labelled the newly formed bone which emitted greenish yellow flourescence when observed under u. v. light. The old bone and graft appeared sea green. The technique was found useful in evaluation the source and amount of newly formed bone, process and rate of resorption of grafts and fate of bone grafts.

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### 3.08. GROUND UNDECALCIFIED BONE SECTIONS : A METHOD FOR EVALUATION OF BONE GRAFTS IN COW CALVES.

B. Parsaalli, Gaj Raj Singh and C. S. Celly  
Division of Experimental Medicine & Surgery  
IVRI, Izatnagar-U.P. 243122

The ground undecalcified bone sections were used for the evaluation of different types of grafts. Three to four millimeters thick cross-sections of the bone including the grafted area were cut with the help of heck-saw. Serial grinding of these sections was done using sand papers of different grit numbers viz. 40, 60, 80 and



Finally, the sections were ground on the hone. During grinding, the sections were kept wet with water. The sections were repeatedly examined under low magnification of microscope for their transparency and structural details.

The photographic enlargements of these sections were found useful for gross evaluation of extent and site of new bone formation, size and density of the graft and union between the graft and host bone. These sections, when examined under the microscope (10x), provided finer details regarding the type and extent of new bone formation and fate of bone grafts.

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### EVALUATION OF 3 TYPES OF INTERNAL SKELETAL FIXATION FOR REPAIR OF EXPERIMENTAL HUMERAL FRACTURES IN COW CALVES.

Sakbir Singh, S. K. Chawla, Kuldeep Singh and D. Krishnamurthy,  
Department of Vety. Surgery & Radiology,  
MAU, Hisar.

Mid shaft humeral fractures were created in 18 clinically healthy crossbred male cow calves aged 1 year 6 month to 2 years under sedation of chloral hydrate and local infiltration of lignocaine HCL. The animals were divided into three groups (A, B and C) of six animals each. K-nails, single steinman pin and double steinman pins were used for immobilization of these fractures in animals of groups A, B and C respectively. Radiographs were taken at different intervals upto at least nine months. The radiographs were evaluated for osteogenic reactions, infection and any migration of internal fixation devices. The results were encouraging in all the groups except the migrations of the pins in groups B & C.

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### BIOMECHANICAL ASPECTS OF EPIPHYSEAL FRACTURE IN CALVES.

A. K. Bhargava and A. K. Saxena; EMS Division,  
IVRI, Izatnagar-243 122 U. P.

Biomechanics deals with forces and acceleration acting on particular point of bone, the analysis of such forces can explain how a different type of fracture occur

in different bones. With various techniques of immobilization if forces are not properly counteracted; fragments can deviate inducing rotation, overriding malunion etc. Slight motion of fragment can lead to the formation of bigger callus entrapping blood vessels, and nerves. These may cause irreversible changes in peripheral tissues. Epiphysis represent true example to demonstrate functional disorders by frictional resistance. This part of the bone bears highest value of stress (at young age being covered by cartilagenous covering) in a line of action of resultant load from diaphysis and metaphysis. The point of entry from external force usually leads to transverse fracture at epiphysis; chipping at times of diaphysis at the exit point of force. The purpose of paper is to discuss the biomechanical factors involved in adequate the biomechanical factors involved in adequate immobilization of epiphysied fracture of metacarpal bone in calves using cooptation, screws, staple and rush pins.

### 3.11. CLINICAL AND RADIOGRAPHIC STUDIES OF METACARPAL FRACTURES IN BUFFALO CALVES, WITH SPECIAL REFERENCE TO HORN-PLATES.

J. N. Mistry and D. M. Tadkod  
Deptt. of Surgery  
Gujrat Vety College, Anand.

"Horn-plates" fabricated from normal horn of dead cattle were evaluated and compared with stainless steel plates in the immobilization of mid-shaft metacarpus fracture in two groups of male buffalo calves (12 in each). By fifteen days after the repair, clinically, no much difference could be observed in both the groups. The animals could bear weight fully after the operation while standing. Lameness still existed in both the groups. However, movement at the fracture site was less evident in the group of animals repaired with horn-plates. No signs of healing could be observed by fifteen days. Breaking and bending of the screws was more common with stainless steel plating. Functional restoration gradually improved in both the groups and the animals were able to walk normally with a slight limp by thirty days. No mobility could be observed at fracture site in both the groups. Radiographically the callus bridging the fracture fragments was more dense in the animals repaired with horn-plates. The gross, clinical and radio-graphic study revealed that horn-plates can very well replace stainless steel plates for the repair of metacarpus fracture.

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Chairman : Dr. Harpal Singh

Rapporteur : Dr. S. N. Sharma

**409. RADIOLOGICAL AND BIOMECHANICAL EVALUATION OF STIFLE JOINT AFTER PROSTHETIC REPLACEMENT OF PATELLA AND PATELLECTOMY-AN EXPERIMENTAL STUDY.**

M. Hoque, A. K. Bhargava and G. R. Singh,  
Division of Experimental Medicine and Surgery,  
IVRI, Izatnagar, UP.

In six goats, patellae were replaced with patellar prosthesis prepared from bovine horn (Group A). Whereas in other group of six goats (Group B) only patellectomy was performed. The periodic radiographs of animals of group A revealed that the prosthetic patella was in position and glided over the trochlear groove of femur as evidenced by the change in position of wireloops. Similarly, intactness of suture materials and gliding of the tendon were demonstrated on the radiographs of patellectomized joints (Group B). The radiographs failed to reveal any evidence of infection, degenerative changes and breach in articular surface of femoral trochlea in both the groups.

The animals of Group A showed early recovery in terms of active range of motion (ARM), extension Lag (EL), flexion deformity (FD) and least quadriceps atrophy and near-normal values were recorded at day-30 post operatively. Although the animals of Group-B, also showed progressive improvement in the parameters with the passage of time but deficiency in ARM, and EL persisted upto day 30 post-operatively. In contrast to the animals of group-A quadriceps atrophy and stifle overflexion of the test limbs were observed in animals of group-B.

#### 4.02. COMPARISON OF THE TECHNIQUE OF PATELLECTOMY AND PATELLAR PROSTHESIS IN REFERENCE TO CERTAIN PATHOLOGICAL PARAMETERS.

M. Hoque, A. K. Bhargava and G. R. Singh,  
Division of Experimental Medicine and Surgery,  
IVRI, Izatnagar, UP-243 122.

An experimental study was conducted in 18 goats divided equally in three groups A, B and C. In group-A, patellar prosthesis prepared from bovine horn was used to replace the patella, whereas in animals of Group-B patellectomy was performed and group-C was kept as control. Clinically, the animals of prosthetic group showed early weight bearing and attained normal walking ability as compared to the animals of patellectomized group. Synovial fluid examination could not demonstrate any abnormalities in the physical nature, total Leucocyte counts (TLC), Differential Leucocyte counts (DLC), Synovial-fluid-blood sugar and sediment examination in both groups A and B. Gross and histopathological examination revealed that patellar prosthesis prepared from bovine horn behaved as an inert material and did not cause any damage to the trochlear groove of femur due to gliding movement of the prosthetic patella. Interestingly, osteoid tissue at the site of union between quadriceps tendon and patellar ligaments was found in two out of six animals of the patellectomized animals (Group-B). Histopathologically, no abnormality was observed in the stifle joint components of the animals of both groups A and B.

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#### 4.03. HISTOMORPHOLOGICAL AND HISTOCHEMICAL STUDIES OF METACARPAL FRACTURES IN BUFFALO CALVES, WITH SPECIAL REFERENCE TO HORN-PLATE

J. N. Mistry and D. M. Tadkod,  
Dept. of Surgery  
Gujarat Vety Colloge, Anand

"Horn-plates" fabricated from normal horn of dead cattle were evaluated and compared with stainless steel plates in the immobilization of mid-shaft metacarpal fracture in two groups of male buffalo calves (12 in each).

The histomorphological picture by fifteen days revealed the healing process of fracture to be more advanced with stainless steel plating. Though, endochondral ossification was evident in both the groups, but it was less in degree with horn-plates. Deposition of calcium as revealed by Von Kossa staining method, was slight, patchy and granular in both the groups of animals. By 30 days histomorphological evidence of healing was one step ahead with horn-plates, as formation of Haversian system could be detected at many places. Looking to the amount of bony and cartilage tissues, it was evidenced that horn-plates afforded better immobilization when compared to stainless steel bone-plating. Simillary calcium deposition was also more and better in fractures repaired with horn-plates.

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#### 4.34 PHYSICAL, CYTOLOGICAL AND BIOCHEMICAL ALTERATIONS IN SYNOVIAL FLUID IN INDUCED ARTHRITIC BUFFALO CALVES AND EFFECT OF AUTOLOGOUS SYNOVIAL FLUID TRANSFUSION (ASFT) ALONE AND IN COMBINATION WITH INTRA-ARTICULAR CORTICOSTEROID (IAC).

B. M. Jani and J. M. Nigam,  
Department of Surgery and Radiology,  
Haryana Agricultural University,  
Hisar.

The study was conducted on 18 buffalo calves divided into three equal groups (A, B & C). Arthritis of joint was created by intra-articular administration of turpentine oil. Group A served as control while in groups B & C treatment with ASFT and ASFT + IAC was carried out respectively on 7th post-induction days. Synovial fluid was collected before induction of arthritis and on 7th, 15th and 30th post induction day for estimation of various parameters viz., relative viscosity, mucin precipitate quality, glucose, total proteins, acid and alkaline phosphatase, sodium, potassium, chloride, calcium and phosphorus. Control group revealed significant alterations in various parameters studied. Treatment with single ASFT did help to normalize altered synovial fluid constituents but synovial fluid did not become completely normal.

Treatment with ASFT+IAC proved highly effective and almost all the parameters under study were brought back to the base line value.

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4.05. HISTOLOGICAL AND HISTOCHEMICAL EVALUATION OF AUTOLOGOUS SYNOVIAL FLUID TRANSFUSION (ASFT) ALONE AND IN COMBINATION WITH INTRAARTICULAR CORTICOSTEROID ( IAC ) IN INDUCED ARTHRITIC BUFFALO CALVES.

B. M. Jani, J. M. Nigam and K. N. Vyas,  
Department of Surgery and Radiology,  
Haryana Agricultural University,  
Hisar.

The study was carried out in 18 buffalo calves divided into three equal groups (A, B & C). Arthritis of knee joint was created by intra-articular administration of turpentine oil. Group A served as control while in groups B & C treatment with ASFT and ASFT+IAC was carried out respectively on 7th post-induction day. All the animals were sacrificed 30 days after induction of arthritis for histological and histochemical evaluation of joint capsule and articular cartilage. Joint capsule of control animals showed severe inflammatory changes like congestion, haemorrhage and infiltration of inflammatory cells with predominance of lymphocytes. Cartilaginous metaplasia was also recorded. In group B, such inflammatory changes were totally absent but there was considerable induration of subintima. In group-C, joint capsule was almost normal and only mild induration was noticed. Articular cartilage in control group showed degenerative changes like severe fibrillation, chondrone formation and fibrous tissue formation. Histochemically this group showed severe to moderate loss of Safranin-O, fast green ( SOFG ) and Alcian blue (AB) staining from the matrix indicating loss of glycosaminoglycans (GAG). Group-B showed minimal response to therapy while group-C showed maximum response, however, cartilage did not return to its normal histologic structure in both treatment groups.

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**ESTIMATION OF CHONDROCYTE DENSITY IN INDUCED ARTHRITIC BUFFALO CALVES AND EFFECT OF AUTOLOGOUS SYNOVIAL FLUID TRANSFUSION (ASFT) ALONE AND IN COMBINATION WITH INTRA-ARTICULAR CORTICOSTEROID (IAC).**

S. M. Jani, J. M. Nigam and K. N. Vyas

Department of Surgery and Radiology

Haryana Agricultural University,

Hisar.

The study was conducted in 18 buffalo calves divided into three equal groups (A, B & C). Arthritis of knee joint was induced by intra-articular administration of turpentine oil. Group A served as control while in groups B & C treatment with ASFT and ASFT + IAC was carried out respectively on 7th post-induction day. All the animals were sacrificed on 30th post induction day and their articular cartilages were collected for the estimation of chondrocyte density and density of empty lacunae on lanameter. The chondrocyte density reduced significantly in all the groups when compared to normal buffalo calves however, in group-C it was significantly higher as compared to groups A & B. The number of empty lacunae which was almost negligible in normal articular cartilage increased significantly in all the groups indicating death of chondrocytes in degenerative joint disease and a slow reparative process in the mammalian articular cartilage.

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**USE OF BONE PLATES PREPARED FROM BOVINE HORN IN FEMORAL FRACTURE IN DOGS : A RADIOLOGICAL STUDY.**

Garam Singh and Gaj Raj Singh

Division of Experimental Medicine and Surgery,

IVRI, Izatnagar-243 122 UP.

The horn plates were evaluated, and compared with stainless steel plates for the management of femoral fracture in 15 clinically healthy dogs of either sex, divided in two groups-A and B consisting of 9 and 6 animals respectively. In all the animals, identical midshaft transverse fracture were created using gigli saw under general anaesthesia. In animals of group A, fractures were immobilized by the horn

plates; whereas venable stainless steel plates were used for the purpose in the animals of group B. Stainless steel screws were used to fix the plates in both the groups.

Radiographic assessment of fracture healing was easy in animals where horn plates were used because of radiolucent property of horn plates. The horn plates as well as stainless steel plates maintained the alignment throughout the period of observation. In none of the animals of both the groups, implant failure was recorded. The radiographs, taken at different intervals, revealed small to moderate size of periosteal callus formation. Bridging of callus was seen at day 60 and 75 in animals of group B and A, respectively. Radiologically no sign of foreign body reaction in the bone or surrounding soft tissue, was seen in animals of group A and horn plates behaved as an inert material. Bone infection observed in 3 and 1 animals of group A and B respectively was attributed to sterilization failure.

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#### 4.08. COMPARATIVE STUDIES ON SIMPLE AND COMPRESSION BONE PLATING OF INDUCED FRACTURE IN CALVES.

R. R. Parsania, K. N. Vyas and M. R. Patel,  
Gujarat College of Veterinary Science,  
and Animal Husbandry, Anand.

In 36 calves, divided into two groups of 18 each, mid-shaft, right metacarpal transverse fractures created with a wire saw, were immobilized by simple plating in one group (I) and by compression plating with a locally fabricated compression device in another group (II). The animals were sacrificed on 15, 30, 60 days post-operatively. The comparative evaluation of fracture healing was made by clinical observations, plain radiography, angiography, histomorphological and histochemical investigations.

Clinically, in the animals of group II weight bearing alongwith disappearance of limping was earlier than group I. By 30 days the hypervascularization at the fracture site, seen in group I animals, almost disappeared in animals of group II. Microscopically, by 30 days the amount of cartilage was less and the matured collagenous fibres and bony trabeculae showed more amount of calcium deposition in group II than in group I. By 60 days the vas-



cular pattern at the site of fracture had returned to normalcy in group II. The organisation of haversian system, deposition of calcium in the cartilage, and newly formed bone and perpendicular orientation of the collagenous fibres to the direction of fracture line were better in group II, as compared to group I. The clinical, radiographic picture revealed better status of fracture healing with compression plating as compared to that with simple plating.

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439 **EVALUATION OF SINGLE AND DOUBLE HORN PLATES FOR TIBIAL FRACTURE REPAIR IN CALVES.**

D. K. Gahlot, S. K. Chawla and D. Krishnamurthy,  
Department of Surgery and Radiology, College of  
veterinary Sc., Haryana Agricultural University,  
Hisar.

An experimental study was conducted to evaluate the outcome of single and double plates of bovine horns, being used in internal fixation of fractured tibia of 12 cow calves. The clinical and roentgenological observations revealed them to be unsuitable for internal fixation in lack of external support for tibial fracture repair.

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442 **INCIDENCE AND ANATOMICAL LOCATION OF FRACTURES IN DIFFERENT ANIMALS : 10 YEARS SURVEY.**

D. B. Patil, B. M. Jani and R. R. Parsania,  
Department of Surgery & Radiology,  
Gujarat Veterinary College,  
Anand-388 001.

A study of 471 clinical cases of fractures in different species of animals spread over a span of 10 years (1978-88) revealed higher incidence in females than males except in dogs, where the incidence in male was more as compared to female animals. Fractures of tibia in bovines and of femur in canines had highest incidence amongst all the bones. However, in goats the involvement of the metacarpus, tibia and meta-

tarsus was almost equal. Regardless of the species, most of the fractures involved shaft of the bones and were either comminuted, oblique or transverse in nature. Percentage of different bones and species involved has been discussed.

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#### 4.11. EQUINE ORTHOPAEDIC AFFECTIONS : A SURVEY REPORT.

**K. Pratap.**

Division of Experimental Medicine and Surgery,  
IVRI, Izatnagar,  
Bareilly-243 122

To work out the incidence of orthopaedic affections in equines, the records of three years w. a. f. July 84 to Jun 87 of 3217 Army animals were critically screened and analysed. The incidence of orthopaedic affections was revealed 23.3% of which the joint affections were more (62.5%) than hoof/foot affections (25.3%). The common conditions involving the joints and feet were : arthritis, sprain, dislocation, exostosis, thrush, quittor, laminitis and wounds. Commonly affected joints of fore limbs were shoulder joint 33.7% and carpal joint 23.6%, and in hind limbs, the hock joint 30.3% and hip joint 22.1%.

Sexual and seasonal variation for respective incidence could not be worked out due to the same working schedule for male and female animals and the free movement of animals from one area to other. ★★★

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**3.11. HYPOSPADIAS AND URETHRAL DIVERTICULA IN GOATS.**

A. P. Singh and M. S. Al-Bedranly,  
S. M. Eshoue and T. A. Abid.  
Department of Veterinary Surgery and Obstetrics,  
College of Veterinary Medicine,  
Mosul University, Mosul Iraq.

Hypospadias and urethral diverticula were recorded in nine and six kids. Hypospadias were perineal in location. Urethral groove located just below the anus and resembled a vulva in three of the hypospadiac kids. In other four, urethral groove appeared as a small external opening on the ventral surface in the perineal area and posterior to the scrotal sac. It was open to the entire length of perineal area in two cases. Underdeveloped penis took a deforming ventral curvatures in five hypospadiac kids. The urethral diverticula were represented by a fluctuating swelling of varying sizes on the ventral surface of the sheath. Partial or complete cleft scrota were seen in all the animals. No other detectable congenital anomalies were associated with hypospadias or urethral diverticula in the present cases.

**3.12. DIAPHRAGMATIC HERNIA IN A CHURI.**

R. S. Kishatwaria and R. L. Bhardwaj  
College of Veterinary Science,  
H. P. K. V. V. Palampur (H.P.)

A churi (Female cross of Jersey and Yak) was presented for the treatment of recurrent tympany and off-feed at Hudan pasture situated at 14000 feet height above sea level in Himachal Pradesh. After the clinical examination, it was suspected to be a case

of diaphragmatic hernia. Treatment for tympany and off feed was given but there was no effect on the animal which died after one month. After postmortem examination, it was confirmed a case of diaphragmatic hernia.

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5.03. TIBIAL FRACTURE IMMOBILIZATION WITH AN EXTERNAL IRON CRUTCH SPLINT IN A 800 POUNDS BUFFALO BULL.

**T. K. Gahlot, Prem Singh,  
I. S. Chandna and D. Krishnamurthy,**  
Department of Surgery and Radiology and Veterinary  
Clinics, College of Veterinary Sciences,  
Haryana Agricultural University,  
Hisar.

An oblique fracture of tibia in an eight hundred pounds buffalo bull was successfully immobilized by splint conforming to the size of limb. The splint was fixed from the groin to the hoof on medial aspect. Limb remained in an extended position during sitting, standing and moving positions while hooves were anchored to the foot plate of the splint by a wire and metatarsal region was plastered with splint.

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5.04. DIVERSE RIB RESECTION THORACOTOMIES FOR DIAPHRAGMATIC HERNIORRHAPHY IN BUFFALOES.

**T. K. Gahlot and S. K. Chawla,  
P. K. Peshin and D. Krishnamurthy,**  
Department of Surgery and Radiology,  
College of Veterinary Science  
Haryana Agricultural University,  
Hisar.

Diaphragmatic herniorrhaphy was undertaken in clinical cases of adult buffaloes which were divided into three groups. The sixth, seventh and eighth rib sub-perio-

vulva for the past three days. Clinical examination revealed a case of traumatic recto-vaginal fistula which was repaired successfully under epidural analgesia.

**5.07. PARAPHIMOSIS DUE TO TRANSMISSIBLE VENEREAL GRANULOMA IN A DOG-A CASE REPORT.**

**S. K. Sharma, Mohinder Singh,  
V. K. Gupta and R. R. Khajuria,  
Department of Veterinary Surgery and Gynaecology,  
College of Veterinary Science,  
HPKVV, Palampur,  
(H.P.)-176 062.**

An Alsatian dog, 2 years of age, suffering from paraphimosis for the last two months was presented for the treatment at local veterinary hospital. There was history of swelling around pre-scrotal penile area for the last six months. On clinical examination, typical dark, pinkish cauliflower growth was seen around the base of penis involving prepuceal sheath. Manual reduction of the penis was not tried. Surgical management of the condition is discussed. Histopathological examination of the growth revealed it to be a case of non-metastatic transmissible venereal granuloma. Paraphimosis looked to be secondary to the granuloma. The patient made uneventful recovery.

**5.08. REPAIR OF BILATERAL MANDIBLE FRACTURE IN A DOG.**

**Mohinder Singh, S. K. Sharma  
and N. K. Vashist,  
Department of Surgery and Gynaecology,  
College of Veterinary Science,  
HPKVV-Palampur (H. P.)**

A dog, aged 3 months was referred to college clinic with the history of hanging anterior portion of lower jaw, protrusion of tongue, drooling of saliva and inability to drink and eat. Clinical examination revealed bilateral mandibular fracture of horizontal rami. The fracture was reduced and repaired by wiring under general anaesthesia. Animal was kept on liquid diet for five weeks. Animal had uneventful recovery.

trial resection was undertaken for transthoracic diaphragmatic herniorrhaphy, respectively Rib resection thoracotomy was found to be more suitable and advantageous than conventional sixth rib resection whereas eighth rib resection thoracotomy was inconveniently feasible.

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#### PREPUICIAL SARCOID IN A HORSE.

Mohan R. Wani and A. H. Ulemain,  
A. G. Bhandarkar and P. E. Kulkarni.  
Deptt. of Surgery and Radiology,  
Panjabrao Krishi Vidyapeeth, Akola,  
(M. S.)

An eight years old horse was presented to Campus Veterinary Hospital, with a history of growth on the prepuce since two months. There was no bleeding. Grossly small nodular growths of varying sizes were seen arising from the prepuicial skin. The horse was operated under sedation and local anaesthesia. The growth was surgically excised. Histopathological examination revealed the growth as sarcoid. There were juvenile capillaries in the collagenous tissue. The proliferating young fibroblasts were seen with deposition of collagen around the juvenile capillaries. However typical palisade arrangement was not seen. There was no recurrence of growth after operation as observed for past three months.

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#### SURGICAL MANAGEMENT OF RECTOVAGINAL FISTULA IN A BUFFALO.

R. L. Bhardwaj.  
Department of Surgery and Gynaecology,  
College of Veterinary Science,  
H. P. K. V. V. Palampur  
(H. P.)

An eight year old buffalo was brought in the Civil Veterinary Hospital Kandaghat (H. P.) with its history of injury at vulva by horn thrust and passing of faeces through

ful healing and wire was removed following clinical union after seven weeks. Animal could attain its normal prehension and mastication activities.

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**5.99. SURGICAL RECOVERY OF OROPHARYNGO-LARYNGEAL FOREIGN BODIES IN BUFFALOES.**

**Prem Singh and D. K. Sharma,  
S. M. Behl and I. S. Chandna,  
Department of Vety. Clinic  
Haryana Agricultural University,  
Hisar.**

Surgical management of oropharyngo laryngeal foreign bodies has been described in five clinical cases in buffaloes. Radiographs of the buccal cavity, laryngo pharyngeal area, trachea and oesophagus could help in indicating the presence of foreign bodies but their exact stereotaxic situation could not be ascertained. In this way the side and site of incision could not be decided. The foreign bodies were either recovered manually or surgically. The sites of the foreign bodies included inside the left mandible, laryngeal and pharyngeal area respectively.

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**5.10. OBSTRUCTIVE CYSTOLITHIASIS IN A BITCH.**

**D. K. Sharma, S. M. Behl and I. S. Chandna,  
Department of Vety. Clinic,  
Haryana Agricultural University,  
Hisar.**

A case of obstructive cystolithiasis in a bitch has been described. The animal was having partial anurea for last six months. Cystotomy was performed and a big prismatic calculi and about 200 small calculi were removed. One big prismatic stone

was blocking the neck of the bladder at sphincter vesicae, causing partial obstruction of urinary passage.

5.11: BILATERAL MANDIBULAR FRACTURE IN A HORSE.

G. R. Singh and C. S. Celly,  
 O. P. Gupta and K. Pratap,  
 Division of Experimental Medicine and Surgery,  
 IVRI, Izatnagar.

Surgical correction of the bilateral mandibular fracture in adult horse was achieved by application of plaster cast ventrally along the entire length of horizontal rami of mandible supported by two pins transfixation through the anterior and posterior fragments of the fracture. The immobilization technique did not interfere with the prehension and chewing actions and fracture healed uneventfully.



*Diwan*  
2/3/88

Session VI

## Clinical Surgery-II

Chairman : Dr. I. S. Chandna

Rapporteur : Dr. Diwan M. Mehmud

### 9.01. OSTEOSARCOMA IN A GREAT DANE.

A. K. Mitra, V. S. C. Bose, A. K. Ray and S. Nayak,  
Department of Surgery,  
Orissa Veterinary College,  
Bhubaneswar.

A five year old Great Dane bitch was suffering from osteosarcoma. The X-ray revealed it to be situated at the proximal extremity of right humerus and was operated.

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### 9.02. PARANASAL TUMOUR IN A HOLSTEIN COW.

A. K. Mitra, A. K. Ray, V. S. C. Bose and S. Nayak,  
Department of Surgery,  
Orissa Veterinary College,  
Bhubaneswar.

A five year old Holstein cow showed nasal secretion, respiratory distress, bulging out of right eye and irregular swelling of frontal, supraorbital and paranasal area of the right side. This was confirmed by X-ray to be a tumour. Tracheotomy and craniotomy were performed.

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6.03. COPROSTASIS DUE TO PROSTATIC HYPERTROPHY IN DOG : A CASE REPORT.

A. K. Srivastava, R. J. Singh

I/C Canine Therapy,

State Veterinary Polyclinic, Lucknow.

Director, Animal Husbandry, U P., Lucknow.

Obstipation of the intestine (coprostasis) was recorded in 8 years old Beagle male dog. The clinical picture was of difficulty in micturation with frequent attempts to defecate. The digital rectal palpation revealed marked enlargement of prostate gland. The radiographic interpretations revealed that the coprostasis was due to prostatic hypertrophy. The hypertrophied prostate narrowed the intestine so that the faeces were obstructed i. e. resulted into constipation. Complete prosta-tectomy was done by prepubic approach and the impacted mass of faeces was removed by entero-stomy

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6.04. MANAGMENT OF TIBIAL FRACTURE IN A COW HEIFER BY STEINMAN'S BONE PIN.

A. K. Srivastava and R. J. Singh,

I/c Canine Therapy,

Vety. Polyclinic, Lucknow,

Director, Animal Husbandry, U. P. Lucknow.

A heifer one year old, having fracture of tibial shaft was brought to this clinic. The immobilization of fractured tibial shaft was done by intramedullary pinning. The steinman bone pin was introduced from the proximal end adjacent to the tibial tuberosity. The complete reunion of the fractured tibial shaft took place nicely within a month of time. Thus the recovery was most satisfactory.

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**A NEW TECHNIQUE FOR SURGICAL MANAGEMENT OF URINARY BLADDER PAPILOMA IN DOG.**

A. K. Shrivastava and R. J. Singh,

M.C. Canine Therapy,

Veterinary Polyclinic, Lucknow.

Sector Animal Husbandry, U. P. Lucknow.

A dog showing clinical picture of frequent micturition, straining for quite long periods but producing only a few drops of urine, general malaise with inappetence, lethargy and pyrexia was brought to this clinic. The urine was alkaline in reaction and containing blood macroscopically due to haematuria. Contrast radiography of urethra and urinary bladder delineated the lesion (papilloma) more accurately. The cystoscopy was performed through transurethral route. A papilloma more or less wart like shape was detected in urinary bladder. The surface of papilloma was smooth, tufted and the base was so small that the growth was pedunculated. The whole mass extracted out by biopsy blades of cystoscope, followed up with cauterization of the site. The pathological investigation of the biopsy-mass revealed, stratified squamous epithelial papilloma containing a connective tissue core. The cystoscopy repeated every 3 month for a year revealed no further recurrence.

**SPONTANEOUS LESIONS IN BRAINS OF SHEEP.**

N. S. Parihar

Division of Pathology, IVRI, Izatnagar-243 122

Pathological study of 106 sheep brains revealed a case of *Sarcocystis* infection in brain stem, 4 cases of subclinical infections with *Coccidius cerebrales* and 98 cases of miscellaneous lesions. The *Sarcocystis* infection did not invite any reaction. *Coccidius cerebrales* caused degeneration and atrophy of brain, perivascular cuffing and foreign body reaction. The non-specific lesions consisted of neuroglial cell reaction on aqueduct of sylvius, olfactory lobe, trigonum olfactorium, caudate nucleus, callosal body, fornix medulla oblongata, midbrain and pyriform lobe, vacuolations in cerebellum, pons, thalamus, pinealocytes and ganglioneurons, and cyst in cerebellum, pons and pituitary. Also perivascular cuffing alone or

in association with foreign body or non-specific granulomatous reaction were noticed in 17 cases classified as inflammatory apparently due to migration of *Oestrus* spp. larvae from the nasal tract into the cranium.

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#### 6.07. DIAPHRAGMATIC HERNIORRHAPHY IN BOVINES.

S. M. Usturge and A. P. Bhokre,  
Department of Surgery,  
College of Veterinary & Animal Sciences,  
MAU, Parbhani.

Successful treatment of 15 clinical cases (12 she buffaloes and 3 cows) of diaphragmatic hernia is reported. Chloralhydrus sedation with local anaesthesia was sufficient to undertake the repair of hernia. Twelve cases were operated through trans-abdominal approach and three cases were operated by trans-thoracic approach. Severe respiratory embarrassment observed in transthoracic surgery was minimised by tightly closing the thoracic wound and maintaining the negative pressure to some extent in thorax. No complication was observed during herniorrhaphy. Out of 15 cases, two animals died due to severe dehydration and poor surgical risk. Transabdominal approach is preferred to transthoracic approach in the absence of general anaesthesia and positive pressure ventilation of lungs.

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#### 6.08. OBSTRUCTION OF NASOLACRIMAL DUCT IN A HORSE.

B. M. Jani  
Veterinary Clinical Complex,  
College of Veterinary Science and A. H., Anand.

A kathi horse aged 5 years was brought to the clinics with the history of persistent lacrimation from the left eye. The case was treated for conjunctivitis as per routine treatment but no improvement was noticed. The obstruction of nasolacrimal duct was suspected. Canulation of the duct was carried out from nasal opening under standing restraint which revealed blockade. Forceful irrigation of

the duct with normal saline expelled out detritus. Flushing of the duct with normal saline mixed with antibiotic daily for two days cured the condition.

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#### A TECHNIQUE FOR THE MANAGEMENT OF COMPLICATED FRONTAL SINUSITIS IN BOVINES.

S. K. Pandey and S. S. Misra,

Department of Surgery and Radiology,

College of Veterinary Science and Animal Husbandry,

Mathura-281 001 (U. P.)

The technique consisted of amputation of horn and fixation of drainage tube in the frontal sinus. Cornual and pericornual analgesia was achieved by blocking the cornual and first cervical nerve. Amputation of the processus cornuus well extending upto the frontal bone was done. The sinus cavity was then examined and pathological tissues extricated. Fenestration of the frontal sinus was done behind the zygomatic process. A fenestrated indwelling sinus-catheter was retained by adequate sutures for subsequent irrigation, drainage and medication. The drugs which were administered through the drainage tube included proteolytic enzymes, corticosteroides and antibiotics till complete recovery was attained.

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#### AN IMMOBILISATION BRACE-SET FOR THE MANAGEMENT OF SECTIONED FLEXORS IN CATTLE.

S. S. Misra,

Department of Surgery & Radiology

College of Veterinary Science & A. H.

C. S. A. University of Agricultural & Technology,

Mathura.

An immobilisation brace-set (anterior/posterior) contrivance devised for the purpose and fabricated locally has been found to be very workable and effective in

the management of sectioned flexors in cattle. The device ensures the stay of the hoof in position giving a relaxed position to the flexors, healing of flexors is therefore, ensured.

#### 6.11. DESMACULUM FOR THE MEDIAL PATELLAR DESMOTOMY.

S. S. Misra.

Department of Surgery and Radiology,  
College of Veterinary Science & Animal Husbandry,  
Mathura-281 001 U. P.

An instrument designated as "desmaculum" was devised for performing medial patellar desmotomy in cattle. It is a flat solid steel device measuring 12.5 cm in length and 2 cm in width with a groove on its dorsum; a holding grip and a pointed anterior end. After adequate skin incision the desmaculum used to penetrate between the structures on the posterior surface of the medial patellar ligament and the handle is manoeuvred to raise the entire ligament, thereafter, it is thrust to come out in the anterior margin of the exteriorised ligament. A reverse knife can be used for total medial patellar desmotomy. This is quite handy, specific for the purpose and advantageous in this routine surgical procedure.

#### 6.12 CIRCUMFERENTIAL PERICORNUAL INFILTRATION ANALGESIA IN BOVINES.

S. K. Pandey and S. S. Misra.

Department of Surgery and Radiology,  
College of Vety. Science and Animal Husbandry,  
Mathura.

A method of circumferential pericornual infiltration block has been evaluated both clinically and experimentally and found to be superior to the one in vogue.

The technique is simple and entails an application of an elastic rubber tube tourniquet retained snugly around the base of the horn. A circumferential belt is made by depositing 30 ml. of 2% procaine hydrochloride solution medially to the tourniquet. The tourniquet is removed during the actual process of surgery. The entire period of surgery, the radical and one of the most painful operation evidenced complete freedom from pain. The duration of this analgesia was 45 to 55 minutes.

Chairman : Dr. Amresh Kumar

Rapporteur : Dr. S. S. Misra

**731. PREVALANCE OF SURGICAL CONDITIONS IN CANINE IN CALCUTTA METRO-POLITON CITY.**

Dipak Kumar De, P. K. Bose and S. Patra,  
Department of Surgery and Radiology, Faculty of  
Veterinary and Animal Sciences,  
Bidhan Chandra Krishi Vaiswavidyalaya,  
Mohanpur, Nadia.

A detailed survey was made to verify the existance of surgical conditions in dogs recorded from private clinics, government hospitals and some trusty organi-sations in the city of Calcutta. Examinations of sample population of 48,812 canine patient presented at the above organisation were recorded during the period from 1.4.85 to 31.3.88 which revealed existance of 19,848 surgical conditions giving a prevelance rate of 46. 36% apart from general medicinal and gynæcological cases. The survey provides an excellant opportunity for small animal practitioner in metro-politon city to evolve a guide line for remedial measure. The incidence and frequency of different Surgical conditions were as follows :

Ovariohysterectomy-20%, hysterectomy-8% tumour-10% caesarian-6% haem-atoma of ear-12%, fracture and dislocation-12% veneral granuloma-2%, dermoid Cyst-1% urolithiasis-6% hernia-0.5%, cosmetic surgery (docking, ear cropping, dew claw operation)-18%, aural resection-0.5%, and wound dressing-5%.

Variation and frequency of above condition on the basis of health, age, season, climate and breed of dogs will be discussed.

### 7.02. THE SURGICAL AFFECTIONS OF CAMEL

**N. R. Purohit, D. S. Chouhan,  
R. J. Chaudhary and P. R. Dudi,**  
College of Veterinary and Animal Science,  
Bikaner, Rajasthan.

The camel suffer from various congenital and acquired surgical ailments. The common surgical conditions include lacerated nostril, ophthalmic injuries, lacerated eye lid, soft palate abscess, mandible fracture, salivary fistula, actinobacillosis, dermoid cyst, saddle-sores, pedestal injuries, ventral abdominal hernia, urine necrosis of abdominal wall, castration, tail gangrene, lymphangitis arthritis, fracture of the limb bones, exuberant granulation of the lower limb, punctured foot, etc. The abscesses, wounds, sinuses, fistulas, haematomas, cysts, tumors, etc. were also commonly encountered.

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### 7.03. A MODIFIED TECHNIQUE OF SPAYING IN CAT.

**Mozammel Hoque,**  
Veterinary Officer-in-Charge,  
State Veterinary Hospital,  
Mathabhanga, Coohbehar (W.B.)

There is a fascination to pet female cat in Northern Bengal and majority of the owners want to have their cat spayed to avoid unwanted population in the family. To work with the existing method of mid-flank-vertical-laparotomy being the patient in ventral position, some obstacle to get the ovary and uterus was being faced from omentum and intestinal loop and to maintain the animal in ventral position during surgical intervention. To overcome the problem, this technique of spaying has been modified and excersised in several cats with a great convenience under local analgesia. Here the animal was kept in an inclined ventral position and an incision was put 1" below and paralld to the mid lumber region sufficient to make entry of index and middle finger of the operator. Put downward pressure to the gut with middle finger and take the nearest uterine cornua with the ovary out of the



wound with index finger by feeling. On traction to the nearest cornua, the other cornua with its attached ovary was drawn out side the operation wound and were removed after ligation. The abdominal wound was closed as usual.

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#### 334. NEUTROPHIL ALKALINE PHOSPHATASE ( NAP ) ACTIVITY IN PERIPHERAL BLOOD SMEAR OF BUFFALO CALVES SUFFERING FROM ACUTE PERITONITIS.

A. P. Bhokre, M. N. Athwale and S. M. Usturge,  
Department of Surgery,  
Marathwada Agricultural University,  
Parbhani.

The neutrophil alkaline phosphatase ( NAP ) activity was assayed quantitatively by cytochemical staining method in experimental peritonitis in buffalo calves. The NAP activity in all groups was measured at pre-disease and at 6, 12, 24, 48 hr after production of peritonitis. The predisease ( normal ) NAP activity ranged between 72.1-95.1 in all animals. Neutrophil showed a very few bluish stained granules in the cytoplasm. After experimental production of peritonitis, the mean NAP activity was significantly increased (152.2-193.2) at 6 hr and subsequent observations at 12, 24 and 48 hr showed a progressive and significant increase in the NAP activity. The cytoplasm of the neutrophil showed moderate to crowded bluish stained granules. The NAP score was highest at 48 hr after production of peritonitis and the values ranged between 637.0 to 335.3 in all groups. The significant increase in NAP activity could be used as one of the indicators for diagnosis of peritonitis.

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## 7.05. LAPAROSCOPIC TECHNIQUE IN SHEEP.

B. A. Bachee and G. M. Wani,  
Division of Animal Production  
Faculty of Veterinary Science, and A. H.  
Post Box No. 461  
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Five local Kashmiri ewes were used for standardization of laparoscopic technique. The genital organs were examined through laparoscopy. The animals were fasted for 12 to 36 hours prior to operation. Laparoscopy was performed under local anaesthesia with triflupromazine hydrochloride as premedicant.

In two ewes, where laparoscopy was performed through right and left paralumbar fossa, the genitalia could not be visualized due to the interference of rumen and bowels.

Midventral approach was found suitable for laparoscopic examination of genitalia in sheep. The genitalia lie just in front of the urinary bladder. For examination of the ovaries, ovarian bursa has to be slightly lifted and turned on one side.

## 7.06. CONTAMINATION STATUS OF COMPOUND FRACTURES AND EFFECT OF SCRUBBING AT DIFFERENT INTERVALS IN DOGS.

K. S. Mudahar, S. N. Sharma and M. S. Oberoi,  
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Punjab Agricultural University,  
Ludhiana-141 004.

The compound fractures of radius-ulna were experimentally created in 15 mongrel dogs. The fracture repair was undertaken at 2, 24 and 72 hours after creation of fracture in five dogs each in groups-I, II and III respectively. Swab samples were taken from the site after shaving and then after scrubbing the same, six times, with savlon (1 : 30). Adopting aseptic procedures, retrograde intra-medullary pinning was done for repair of radius-ulna fracture. Culture sensitivity based antibiotics were given

for a week postoperatively. The skin of dogs was found heavily contaminated ( $1617.80 \pm 1113.35$  cfu/ml) with different types of micro-organisms. The degree of infection increased with the increasing time gap between creation of fracture and availing the treatment. After scrubbing with savlon for six times, there was 99% reduction in bacterial counts. *Staphylococcus aureus*, *E. Coli*, *Klebsiella* spp., *Edwardiella* spp. and *Pseudomonas* spp., isolated in the unscrubbed skin, were not found after scrubbing, but *Bacillus* spp. and *Staphylococcus* spp. did not yield completely to scrubbing. All the fractures healed satisfactorily and there was no clinical or radiographic evidence of infection.

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#### 237. HERNIAS IN ANIMALS : A REVIEW OF 59 CASES.

A. P. Singh, S. M. Eshoue,  
J. F. Rifat and N. G. Fatehea.  
Mosul University,  
Mosul, Iraq.

Clinical survey of hernia showed an incidence of 4.1% (59/1455). Incidence of hernia was more in cattle (57.6%) and sheep (32.2%). Females were involved more (61%) than males (39%). Thirty one hernias were congenital (52.5%), and 28 were acquired (47.5%) in nature. Anatomically, 27 hernias (45.8%) were umbilical, 19 ventral (32.2%), 7 inguinal (11.8%), 5 diaphragmatic (8.5%), and one scrotal (1.7%) in location. Diaphragmatic hernia was recorded for first time in Iraq.

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#### 238. SURGICAL AFFECTIONS IN WILD MAMMALS.

B. M. Arera, G. R. Singh and A. K. Bhargava  
Indian Veterinary Research Institute  
Izatnagar, 243 122 (U. P.)

The important surgical afflictions recorded in wild mammals were : Radial nerve paralysis in a semi-captive female Rhinoceros (*Rhinoceros unicornis*), in a young

adult male nilgai (*Poseelaphus tragocamalus*) and in a female black buck (*Antelope cervicapra*), fracture in 5 cases of Black bucks (*A. cervicapra*), dislocation in a 3 month-old fawn and in an adult black buck (*A. cervicapra*) in semi captivity and osteoperiosteitis in hind feet of 3 female deer (*A. axis* 2, *A. porcinus* 1). In a young adult male hog deer (*A. porcinus*), traumatic severe extensive wound in left thigh infected with *Staphylococcus* and *Clostridium*, involving tuber ischium was recorded and successfully managed with administration of Geramycin and dressing with Soframycin. Clinically chronic osteomyelitis, involving whole length of ulna and proximal third of radius, was diagnosed in a tigress (*Panthera tigris*) captured from wild and brought to a zoo. X-ray showed osteoarthritis of elbow joint with loss of joint space and eburnation of the articular surfaces of olecranon, radius and humerus. An abnormal growth at the pedicle of antler in a sambar (*Rusa unicolor*) was suspected for horn cancer. Lacerations and crushing of gums and lips in semi-wild chitals (*A. axis*) occurred during capture operation.

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#### 7 09. CORRELATION BETWEEN HYPERGLYCEMIA AND HYPERCHOLESTEROLEMIA IN RABBITS.

R. K. Agarwal, A. K. Bhargava and N. P. Bhalla.  
I.V.R.I. Izatnagar (U.P.) 243122

Herbal drugs (*Termanalla arjuna*) compound, *Azadirachta indica*, Fenugreek seeds and Abana) were tried in experimental rabbits for their pharmacological effect, if any, as anti-hypercholesterolemic and antihyperglycemic agents. Serum cholesterol and blood glucose were estimated at different intervals following the administration of the drugs. It was observed that the animals which had higher concentration of cholesterol also had higher levels of glucose. The drug (Cardiotone (H) prepared from *T. arjuna*) proved most efficacious in maintaining the level of cholesterol and glucose within normal limits. A positive correlation existed between the blood levels of cholesterol and glucose in positive control group as well as in treated group.

**MYOCARDIAL PERFUSION FOLLOWING REGULAR ADMINISTRATION OF CARDIO-PROTECTIVE HERBAL DRUGS IN RABBITS-AN ANGIOGRAPHIC STUDY.**

A. K. Bhargava, Arup Das,

R. K. Agarwal, and N. P. Bhalla.

Division of Experimental Medicine and Surgery,

I.V.R.I. Izatnagar.

The use of herbal drugs in experimentally induced hypercholesterolemia has shown a positive correlation between lowering of blood cholesterol and secondary hyperglycemia. *Terminalia arjuna* showed better results than Abana, Neem seed oil, and methi. Coronary angiograms of freshly sacrificed animals demonstrated adequate visualization of main coronaries and their tributaries, thus, helped in the evaluation of myocardial perfusion in rabbits under study. Angiographic pattern established that drugs which lower or normalize blood cholesterol level improve myocardial perfusion. It was seen that high cholesterol level in blood may reduce myocardial arterial perfusion, thus induced anginal effect.

**A COMPARATIVE STUDY ON THE ANTIHYPER-CHOLESTEROLEMIC EFFECT OF HERBAL DRUGS IN RABBITS.**

N. P. Bhalla, R. K. Agarwal and A. K. Bhargava

Division of Veterinary Public Health

Indian Veterinary Research Institute,  
Izatnagar.

Four herbal drugs (Abana, Nimbola, Methi and Arjuna compound) were tried for their antihypercholesterolemic effects in experimental albino rabbits. The average values of TC and HDL-C recorded before putting them on cholesterol supplement and herbal drugs were 96.02 and 47.5 mg/100 ml of blood with average TC/HDL-C ratio of 2.02. It was observed that Abana, Nimbola and Methi could not restrict the rise of total cholesterol in the sera of the rabbits of their respective groups, whereas Arjuna compound kept the TC levels within the normal limits and were very much comparable to the TC level of negative control animals.

This seems to be the first report where the levels of total cholesterol were kept within the normal limits by the administration of a herbal drug (Arjuna compound) even when the animals were on a cholesterol rich diet.

712. HEALING OF ILEAL ANASTOMOSIS : EFFECT ON HYDROXYPROLINE CONCENTRATION AND BURSTING STRENGTH IN ILEAL WALL.

I. V. Mogha, H. P. Singh and Amresh Kumar,  
Department of Surgery and Radiology,  
G. B. Pant University,  
Pantnagar (Nainital).

Twelve adult indigenous goats, of either sex, weighing about 20-25 kg were subjected to resection and anastomosis of the caudal ileum using a single layer inversion technique. The biopsy materials were collected on day 1st, 3rd, 5th, 7th, 21st and 28th post-operatively. The mean minimum and maximum bursting pressure were 198.6 mm Hg and 385.6 mm Hg on day one and twenty one respectively. The hydroxyproline and total protein content were significantly high on day 7 and low on day 1 post operatively. The hydroxyproline concentration returned towards normal on day 28 after anastomosis.

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713. AUTO-RADIOGRAPHIC STUDY USING I 125 GEL SAMPLES : AN EXPERIMENTAL EVALUATION.

H. C. Setia, Om Kumar and G. R. Singh,  
Division of Experimental Medicine and Surgery,  
I. V. R. I., Izatnagar, U. P.

Auto-radiographic procedure for I 125 Gel Sample was standardized by taking 15 samples, which were divided into three groups to find out the effect of different sample activity, exposure times and two types of films. In first group of five samples, gels of different activity were evaluated. In second group of five samples, films were exposed for different time intervals where as in the third group of six samples, LK2 ultrafilm and Indu medical x-ray films were compared, keeping all other factors constant. The cassette with intensifying screens and the same processing conditions were used throughout the study. Better results were obtained with samples having activity of about 3000 c. p. m. with exposure time of 72 hour and by using Indu medical x-ray films.

**214. RADIOLOGICAL EVALUATION OF PULMONARY LESIONS IN RHESUS MONKEYS.**

**K. R. Bhardwaj, Rishendra Verma and A. K. Bhargava,**  
Division of Laboratory Animals,  
Central Drug Research Institute,  
Lucknow-226 001.  
Division of Experimental Medicine & Surgery,  
I. V. R. I., Izatnagar.

Survey of more than 100 randomly selected radiographs revealed that majority of lesions were localised in cardiac lobes. General radiographic signs included organised lesions in apical lobe, consolidation of cardiac lobe, interstitial fibrosis of lower lobes and pleuro-pericardial adhesions. Pleuritis was marked from shallow costo-pericardial adhesions. Pleuritis was marked from shallow costo-phrenic angle, thickened pleural septa, and radiating white streaks between heart/lung and diaphragm. In acute cases, pulmonary oedema was complicated with compensatory heart enlargement. Survey failed to reveal incidence of pericardial effusions as seen in human patients. Cavitation, hilar lymphadenopathy, millary calcifications and abscess formation of less significance. In cases of partial lung collapse, shifting of mediastinum, loss of cardiac silhouette, prominent bronchial markings were the common radiological signs. It was evident that radiological examination of thorax in monkeys provide valuable informations to certify fitness of the animal for laboratory investigations and preventing professionals from hazards of communicable diseases. Other miscellaneous affections included, left ventricular enlargement, diaphragmatic hernia, pulmonary carcinoma, prominent aortic knob, bronchiectasis, vesicular emphysema, elevated diaphragm and cardiac displacement.

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**215. HEPATOGRAPHY IN ANIMALS : AN EXPERIMENTAL STUDY.**

**P. K. Peshia, S. K. Chawla and T. K. Gahlot,**  
Department of Surgery and Radiology,  
College of Veterinary Sc.,  
Haryana Agricultural University,  
Hisar.

An experimental study was carried out in bovines, caprines, equines and ovines to visualize the liver by percutaneous contrast hepatography by injecting Conray 420

into the liver parenchyma at the site chosen: 4 inches posterior to the last rib in upper third of abdomen. These animals were fasted 24 hours before radiography and peritoneal cavity was inflated by oxygen. The degree of visualization of the liver and its parts will be discussed.

#### 7.16. RADIOLOGICAL OBSERVATIONS IN CHRONIC EXPERIMENTAL LEAD POISONING IN GOATS.

S. K. Maiti, D. Swarup and G. R. Singh,  
Division of Experimental Medicine and Surgery,  
Indian Veterinary Research Institute,  
Izatnagar-243 122, U P.

Twelve healthy goats aged 9-12 months were subjected to oral administration of aqueous solution of lead acetate @ 10-20 mg/kg b. wt. daily for 91 consecutive days. Six goats served as healthy control. Radiographs of chest and long bones were taken at 15 days interval till the termination of the experiment. Radiograph taken at day 30 revealed increased radiographic density at the distal metaphysis just proximal to epiphyseal plate in the lead acetate treated goats as compared to the healthy controls. The radiographic density increased gradually and the so called 'lead line' became appreciable at the distal metaphysis of radius by 45th day of lead acetate treatment. The 'lead lines' increased in intensity during subsequent period of treatment and were most prominent at day 90th of the experiment. On the basis of present study, it can be suggested that radiological screening of the long bones, particularly radius may be used as a routine screening test for detecting chronic lead poisoning in goats. □□□



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