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STUDIES ON SOME THORACIC AFFECTIONS IN BUFFALOES AND CATTLE

(With 12 Figures)

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دراسات على بعض إصابات الصدر في الجاموس والأبقار

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تم إجراء هذه الدراسة على عدد ٦٠ حيوان (٤٢ من الجاموس و ١٨ من الأبقار) تعاني من إصابات في الصدر . وقد أظهرت هذه الدراسة أن أهم إصابات الصدر في الجاموس والأبقار هي فتاق الحجاب الحاجز (٣٤ حالة)، إلتهاب التامور الرضي (٢٣ حالة) وإنسداد المرئ الصدري (٣ حالات). وقد أعتمد التشخيص والتشخيص المقارن لهذه الحالات على الفحص الأكلينيكي والإشعاعي وتم إجراء عمليات فتح البطن وفتح الكرش للتأكد من التشخيص وللعلاج.

SUMMARY

The present study was carried out on 60 animals (42 buffaloes and 18 cattle) suffering from thoracic disorders. The most common affections of the thorax in Buffaloes and Cattle in the present study were diaphragmatic hernia (34), traumatic pericarditis (23) and obstruction of the thoracic oesophagus (3). Diagnosis and differential diagnosis of such cases depends mainly on the clinical signs and radiography. Laparotomy and rumenotomy were performed for confirmation of diagnosis and for treatment.

Key words: *Thoracic Affections, Buffaloes and Cattle.*

INTRODUCTION

Thoracic cavity contains different organs representing the digestive system (oesophagus), respiratory system (lung & bronchial tree) and cardiovascular system (heart and large blood vessels). Diagnosis of the thoracic affections of these organs is somewhat confusing and considered to be a complex problem for veterinary surgeons.

The case history, clinical signs and radiographic examination may be of help in diagnosis and differential diagnosis of different thoracic affections. In addition, laparotomy and rumenotomy had been used for confirmation of diagnosis and for treatment.

Sporadic reports have appeared on the surgical disorders of the thorax in buffaloes and cattle (Bhargava and tyagi 1975, Nigam, Singh and Mirakhur 1980 and Radostits, Blood and Gay 1994)

Numerous thoracic disorders were diagnosed in buffaloes and cattle including; diaphragmatic hernia, tuberclosis, bronchopnemonia, metastatic neoplasia, pericarditis and hydrothorax (Nigam, et al 1980).

Bhargava and Tyagi (1975) stated a report on radiological diagnosis of thoracic disorders in 144 clinical cases of large animals.

Plain and contrast radiography had been used widely in diagnosis of diaphragmatic hernias, traumatic reticuloperitonitis, traumatic pericarditis and oesophageal obstruction in cattle and buffaloes (Singh and Nigam 1980, Kumar, Khohli, Prasad, Singh and Sharma 1980, Singh & Nigam 1981 and Nassimi, Krishamurthy, Sharma and Chandna 1985).

The aim of the present study is to state the prevalent thoracic disorders in buffaloes and cattle and to establish the role of clinical examination, radiography and laparotomy in the diagnosis and differential diagnosis of these affections.

MATERIALS and METHODS

The present study was carried out on a total number of 60 animals (42 buffaloes and 18 cattle) suffering from thoracic conditions. The affected animals were selected from the clinical cases presented to clinic of Faculty of Veterinary Medicine, Assiut University.

They were classified according to the type of thoracic affection into, diaphragmatic hernias (34), Traumatic Pericarditis (23) and

obstruction of the thoracic oesophagus (3). The case history of each animal was determined. Clinical examination, radiological examination and treatment either medical or surgical were performed when dictated. Pericardiocentesis was performed in some cases of traumatic pericarditis. Operations include laparotomy, rumenotomy and rumenostomy were performed in standing position under effect of paravertebral and local infilteration analgesia of 2% xylocaine Hcl solution. Many cases were subjected to postmortem examination.

RESULTS

The following table illustrates different types of thoracic affections recorded in the present study in relation to species of animals

Thoracic affections / Animals	Diaphragmatic hernia	Traumatic pericarditis	Obstruction of thoracic oesophagus	Total
Buffaloes	31	10	1	42
Cattle	3	13	2	18
Total	34	23	3	60

I - Diaphragmatic hernias: (Fig. 1-4)

The total number of cases suffering from diaphragmatic hernias in the present study were 34 animals (Buffaloes = 31 and Cattle = 3).

Case history:

All cases were females and presented with a history of loss of general condition, off food, recurrent tympany mainly at the left flank, reduction or complete cessation of milk yield and scanty, pasty to hard black feces.

Animals with diaphragmatic hernias were presented at any age, but most of them were at age group from 4-7 years (23 out of 34), 4 cases were presented at age less than 4 years and 7 cases above 7 years.

Sixteen animals were presented in a state of pregnancy (1 = 2 mo, 4=3 mo, 2 = 4 mo, 4 = 6 mo, 2 = 7 mo and 3 = 8 mo) and 18 animals were presented in non pregnant state but within a period from 10 days to two months after parturation.

Clinical examination:

Pain tests revealed positive results in most cases and the response of the animal was expressed in the form of retraction of the mouth commissure, protrusion of the tongue and grunts.

Metal detector indicated positive results in 26 cases out of 34 specially at the level of the reticulum and between the thoracic limbs. Tachycardia was evident. Ruminal motility was increased and the left flank was elevated nearly in all cases. Detection of regions with less respiratory sound through thoracic auscultation and dull percussion suggested the presence of diaphragmatic hernia in all cases.

Radiological examination:

Lateral right-left plain radiography on the thorax indicated presence of herniated part of the reticulum. The soft tissue density of the hernial swelling was detected superimposed over the heart and the radiographic silhouette of metalic objects of variable shape and size were seen within the herniated part of the reticulum.

Laparotomy findings

Introduction of the right hand to the level of the reticulum through laparotomy wound indicated presence of adhesions between the reticulum and diaphragm in all cases. In 22 cases the hernial ring could be palpated. In the other 12 cases extensive adhesions were present and interfered with hernial ring palpation. Rumen was soft, bulged and appeared to have a large amount of fluid and gases. Omasum was soft and abomasum was empty. Other abdominal structures were clinically normal.

Rumenotomy findings:

Incision of the rumen revealed presence of soft, foamy and borridge – like contents which gushed out specially with inspiration. The contents were filled with minute bubbles of gases. Full hand could be introduced and moved freely in all directions inside the rumen. ¼ to ¾ of the reticulum was found herniated inside the thoracic cavity. The reticular cells were errected and rumino- reticular orifice was displaced craniad. In all cases, surgeon's hand could be passed through the hernial ring into the hernial swelling but palpation of the cranial, right and ventral surfaces of the swelling was difficult in many cases. Left surface was readily palpated and located right to the heart and through which the heart beats were detected very easily.

The site of hernial ring was located right to the median plane in all cases and very close to the right and ventral thoracic wall. The hernial

ring was hard and thickened in most cases with very clear rounded or oval opening with a diameter veried between 1o – 18 cm. The right margin of hernial ring was not clear in 4 cases and laid directly on the right thoracic wall. Manual reduction of herniated part of the reticulum through the hernial ring was impossible in all cases. Two hernial rings were recorded in one case. The second small hernial defect was found ventral to the original one and small part of the reticulum was herniated through it.

Foreign bodies were recovered from the herniated part of the reticulum in 26 cases. These foreign bodies include nails, sewing needles, metal objects, pieces of wire, leather bags, keys, hair clips, coins, stones, etc. Many of these sharp foreign bodies were found penetrating the mucosal folds of the reticular cells or penetrating the full thickness of the reticulum. Ruminal fistula was performed as a temporary treatment in some late pregnant cases till parturation.

Postmortem findings:

Most cases were selectively slaughtered and postmortem findings were recorded. Opening of the right thoracic wall usually revealed presence of a large rounded or oval swelling at the level of 6th rib craniad to the level of 5th or 4th rib. Adhesions were detected between the hernial swelling and caudal lung lobe with gray hepatization in many parts of it. In several cases a small swellings containing sangenous fluid were found attached to the hernial swelling and in one case a separate perireticular abscess was present.

Examination of the reticular wall revealed presence of intramural abscess, reticular ulcers and embedded foreign bodies inside the reticular wall in some cases. The seat of the hernial ring was found at the muscle- tendineous part of the diaphragm ventral to the caudal vena cava and right to the midline in 24 cases and at the tendineous part only in 10 cases. The hernial swellings, in average, were 15x25 cm in diameter and consisted of a part of the reticulum covered by a layers of peritonium and pleura (hernial sac) which could not be easily differentiated from each other and completely adhesed to the herniated reticulum. Hernial swellings were ¼ to ¾ of the size of the reticulum.

II- Traumatic Pericarditis(Fig. 5-11)

The recorded cases of traumatic pericarditis in the present study were 23 animals (13 cattle and 10 buffaloes).

Case history:

All cases were females, of age group between 5-8 years (17 cases), less than 5 years (4 cases) and above 8 years (2 cases). 7 cases were pregnant and 16 non pregnant. The animals were presented with history of complete anorexia, rapid body weight loss, reduction of milk yield, sudden appearance of mandibular and brisket oedema and filling of the Jugular vein.

Clinical examination:

The affected animals revealed jugular destention, brisket and mandibular oedema and evidence of thoracic pain. In some cases oedema of the thoracic limbs and ventral abdominal wall was clear. Arched back and winged elbows were evident in many cases. Auscultation revealed muffled heart sound and dyspenea. Increased in the pulse rate (100/Mins) and rise of body temp. up to 40 °C were detected in many cases. Pericardiocentesis revealed presence of purulent exudate coming out from the pericardial sac in jets with heart beats.

Radiological examination:

Plain radiography of the thorax revealed poor differentiation of the thoracic contents. The contour of the diaphragm was lost and the cardiac silhouette was undifferentiated. In some cases, the shadowgraph of metalic foreign bodies were detected at the level of the heart or in the area connecting the dome of the diaphragm with the heart.

Postmortem findings:

All cases were slaughtered and postmortem findings were recorded. Adhesions between reticulum, diaphragm and pericardium were observed in all cases. Hydrothorax was detected in 7 cases. A fibrous connective tissue cord connecting the reticulum and the pericardium and passing through the diaphragm was seen in 5 cases. In all cases purulent exudate, often mixed with fibrin, was filling the pericardial space and was present within the epicardium and pericardium. The pericardium and epicardium was found thickened up to 15 mm. The weight of the heart with its filled pericardial sac reached up to 16 Kgs in some cases. Foreign bodies were detected inside the fibrous connective tissue cord, in the pericardial sac or inside the heart ventricles in 8 cases (sewing needles in 7 cases and piece of wire in one case). In other cases foreign bodies were recovered from the reticulum either penetrating its wall or floating within its lumen.

III- Oesophageal obstruction: (Fig. 12):

Complete obstruction of the thoracic oesophagus was recorded in three cases (1 buffaloes and 2 cattle)

Case history:

All cases were females and presented with a history of sudden regurgitation of food and water, profuse salivation, inability of swallowing and acute bloat.

Clinical findings:

Clinical examination of the affected cases revealed severe bloat, excessive salivation, extention of the head and neck, tenesmus and sunken eyes.

Radiological examination:

Lateral projection of plain radiographs on the thorax revealed presence of rounded soft tissue mass density at the cardia in one case and cylindrical sussage-like soft tissue mass density at the level of the cardia in the other two cases.

Laparotomy and rumenotomy:

Laparotomy of the affected animals revealed presence of an elevated rumen with firm contents at the ventral ruminal sac.

Rumenotomy revealed presence of very hard ruminal contents molded to take the shape of different ruminal compartments with a large amount of gases over it.

Examination of the thoracic oesophagus through the cardia in the first case (cow) revealed presence of a rounded foreign body situated 5 cms cranial to the cardia. This foreign body was extracted through the cardia to the rumen then to outside. It was an intact orange, 7 cm diameter, which lead to complete obstruction of thoracic oesophagus. In the second case (cow), a plastic bag containing food materials and extending from the cardia craniad to about 15 cm causing complete obstruction of the thoracic oesophagus was discovered. The bag was removed with its contents from the cardia to the outside. In the third case (buffalo), a leather rope with some attached hardened food material was seen extending 10 cm craniad to the cardia and causing complete oesophageal obstruction. The leather rope with attached food material was removed to outside.

All cases of thoracic oesophageal obstruction underwent complete recovery after removal of the foreign bodies through rumenotomy operation.

DISCUSSION

Thoracic affections in buffaloes and cattle diagnosed in the present study were diaphragmatic hernias, traumatic pericarditis and obstruction of the thoracic oesophagus. Nigam et al (1980) recorded cases of tuberclosis, bronchopneumonia, metastatic neoplasia, and hydrothorax, in addition to the aforementioned thoracic disorders. Diagnosis of such affections were based on history, clinical signs and radiography (Radostits, et al, 1994, Tyagi and Singh 1996, Misk, Semieka and El-Sebaie 1998).

Animals having diaphragmatic hernia were mainly suffering from off food, recurrrent tympany, reduction of milk yield and scanty black feces. Diaphragmatic hernia occurs frequently in animals of age group between 4-7 years i.e. middle age mature animals. It was encountered in pregnant animals in about 45% of cases. The condition was observed at any month of pregnancy. Non pregnant animals were usually suffering from the condition during pregnancy but presented to the clinic later on after parturation.

Metal detector indicated positive results specially between the thoracic limbs due to the presence of most metalic foreign bodies inside the herniated part of the reticulum. Which was usually located at the ventral thoracic wall right to the heart. Foreign bodies may be the actual cause of diaphragmatic hernias in animals. During the process of reticular contractions, the foreign body lodged in the reticulum pricks the diaphragm constantly and may make perforations. Sometimes, infected foreign bodies may lead to abscess formation in the diaphragm. Thus the functional strength of the diaphragm is reduced considerably (Tyagi and Singh, 1996). Diagnosis of diaphragmatic hernia was confirmed by plain radiography on the thorax which indicated the presence of the herniated part and discontinuity of the diaphragm (Bhargava and Tyagi 1975; Nassimi et al 1985 and Misk et al 1998).

Traumatic pericarditis is a disease resulting from piercing of the reticulum by metal objects. The animals usually swallow discarded needles, nails, bits of wire and similar hardware because of their indiscriminate feeding habits. These sharp metal objects penetrate the wall of the reticulum and slowly move, encompassed in reactive granulation tissue, usually eliciting localized peritonitis with formation of perireticular abscess in some cases. The direction that the foreign object travels is usually anterioventral, through the diaphragm and pleura, and into the pericardium and heart. Profusely exudative fibrino

purulent pleuritis and pericarditis develops (Jones, Hunt and King 1997).

In the present study the main cause of traumatic pericarditis was needles and sometimes parts of a wire. Pericarditis was characterized by fibrosis and thickening of the pericardial sac which restricts diastolic filling and compromises cardiac function. It is a potential sequela of pericardial inflammation or the deposition of fibrin within the pericardial sac (Foss 1985, and Hardy, Robertson and Reed 1992).

The most diagnostic clinical signs for traumatic pericarditis are complete anorexia, rapid body weight loss, reduction of milk yield, jugular destintion and sudden appearance of mandibular and brisket oedema. By auscultation of the thorax, the heart sounds are muffled (Rodostits et al 1994 and Tyagi & Singh 1996).

Pericardiocentesis is a useful but somewhat risky technique used to draw purulent exudate from the pericardial sac (Rings, 1995). Radiography confirm the diagnosis of traumatic pericarditis where it revealed poor differentiation of pericardium and diaphragm. The shadowgraph of the metalic foreign bodies at the level of heart were detected.

Choke, obstruction or impaction of the oesophagus occurs when large or inadequately chewed and lubricated food, such as beets, potatoes, corn cobs, apples, bones, masses of grain or fibrous ingesta, lodge in the lumen of the oesophagus. This often occurs where the oesophagus is slightly restricted normally, at the area over the larynx, the thoracic inlet, the base of the heart and immediately anterior to the diaphragmatic hiatus (Jennings1984 and Jubb, Kennedy & Palmer 1993). In the present study oesophageal obstruction was recorded in three cases and all immediately anterior to the diaphragmatic hiatus. Types of foreign bodies varied than that recorded in the literature and this variation may depend upon the surrounding envirnoment.

Animals affected by complete obstruction of thoracic oesophagus were presented to the clinic suffering from sudden regurgitation of food and water, salivation, inability of swallowing and acute bloat. Clinical examination of these animals and observation of these signs greatly facilitated diagnosis which was confirmed by plain radiography on the thorax. Organic matters as food materials and fruits were easily seen on plain x- ray films because the seat of cardia and caudal part of the oesophagus are situated in a background of radiolucency induced by air-filled lungs.

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LEGENDS OF FIGURES

Fig. 1: Diaphragmatic hernia in a buffalo showing the contents of the rumen during rumenotomy operation in a form of a foamy borridge- like liquid gushed out from the rumen.

Fig. 2: Diaphragmatic hernias in buffaloes showing the hernial swellings and the adhesions with the surrounded organs during postmortem examination.

Fig. 3: Diaphragmatic hernias in buffaloes showing the hernial swellings dissected from the surrounding structure during postmortem examination.

Fig. 4: Diaphragmatic hernias in buffaloes showing reticular ulcers (A), reticular abscesses (B&C) and embedded foreign bodies(D) on the mucosal surface of herniated reticulum.

Fig. 5: Showing several cases of traumatic pericarditis in buffaloes and cattle with their characteristic mandibular and brisket oedema and Jugular destention.

Fig. 6: Other cases of traumatic pericarditis showing clear submandibular and brisket oedema.

Fig. 7: Showing winging of the elbow as a sign of traumatic pericarditis in a cow (a) and buffalo (b).

Fig. 8: Showing purulent exudate coming out from the needle through pericardiocentesis in cattle affected by traumatic pericarditis.

Fig. 9: Showing aspiration of purulent exudate through pericardiocentesis in cattle affected by traumatic pericarditis.

Fig. 10: Showing fibrous connective tissue cord connecting the reticulum and the heart passing through the diaphragm in cases of traumatic pericarditis.

Fig. 11: Opened pericardial sac in cases of traumatic pericarditis showing presence of large amount of purulent exudate in addition to the precipitated fibrin and thickened pericardium.

Fig. 12: Showing oesophageal foreign bodies extracted during rumenotomy operation through the cardia, intact orange (a) and plastic bag containing food materials (b).

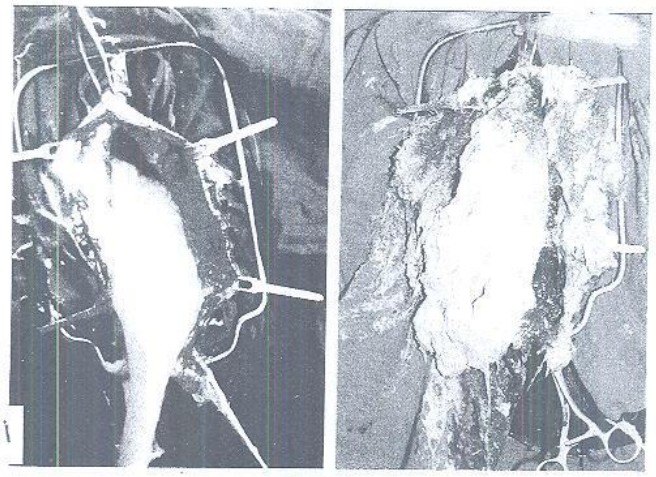
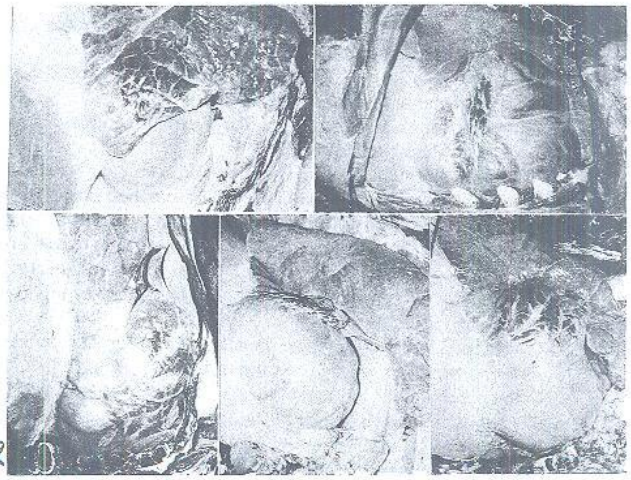


Fig. 1



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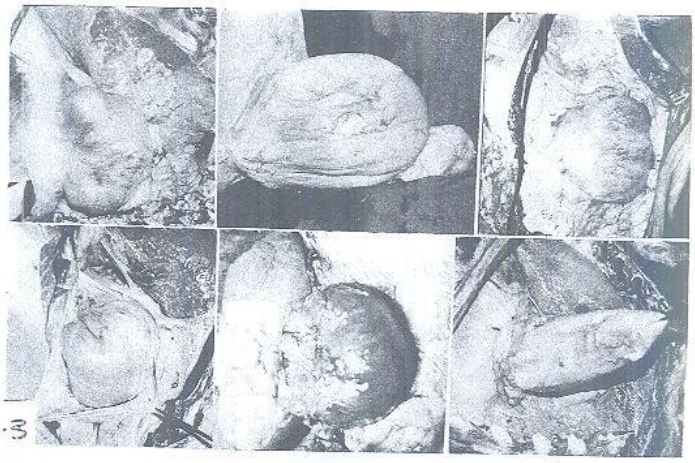

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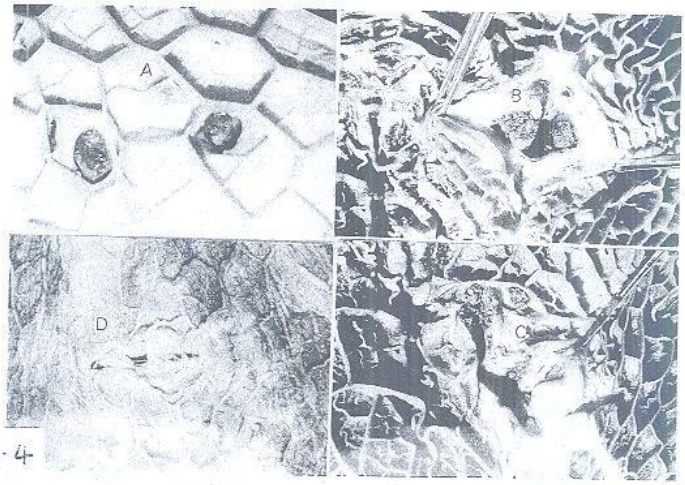

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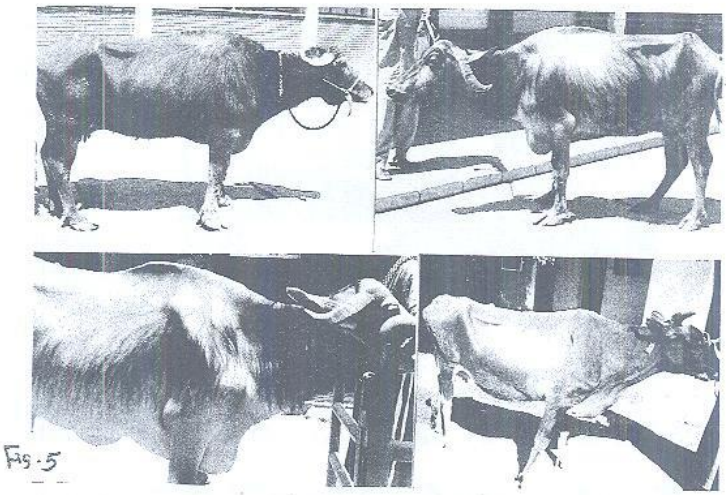

Fig. 5

Fig. 6

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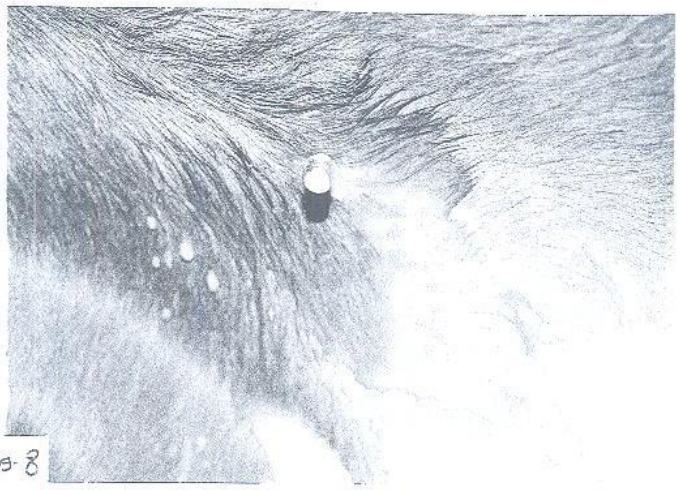

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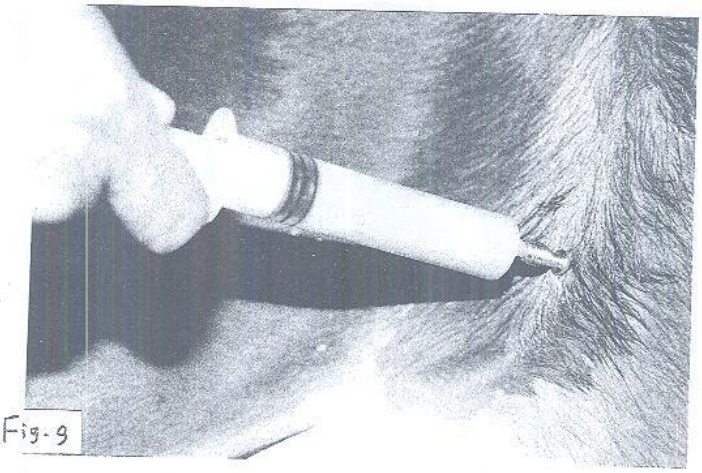

Fig. 9

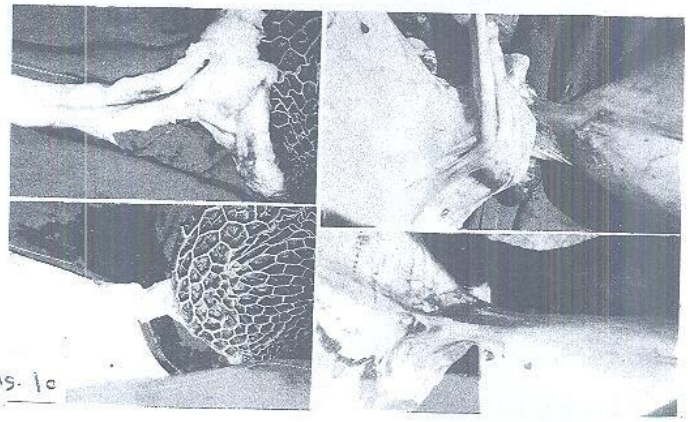

Fig. 10

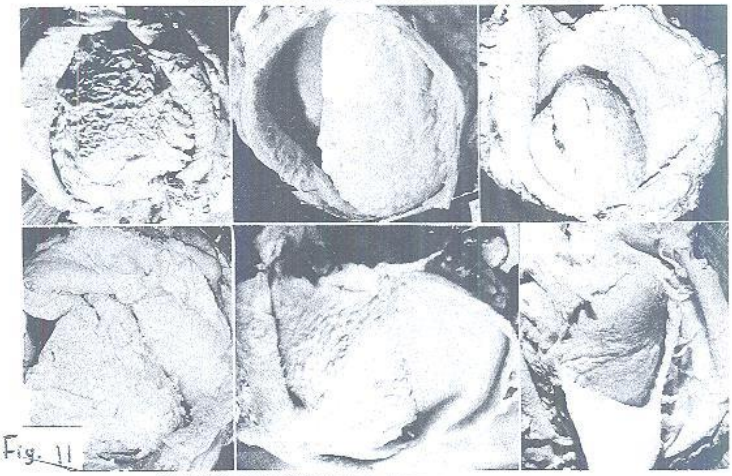

Fig. 11

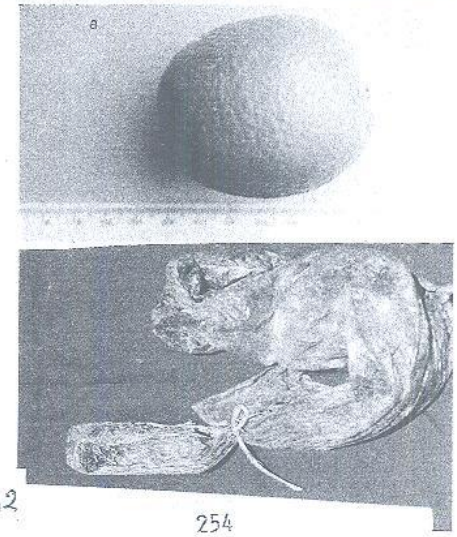

Fig. 12