

بتر القائمة الخلفية فى الماعز

ن • مسك • ع • حفنى

فى هذا البحث تم اجراء عمليات مختلفة لبتر القائمة الخلفية للماعز (التفصل عند مفصل الفخذ ، البتر فى منتصف عظمة الفخذ والتفصل عند مفصل الرضف) • وكان الغرض من هذا البحث معرفة مدى تأثير الماعز بعد بتر القائمة الخلفية أثناء الحركة والمشى وكذلك توضيح العمليات الجراحية المتبعة فى ذلك بالتفصيل وأثبت نتائج هذا البحث بأن الماعز تستطيع المشى والحركة والجرى بسهولة بعد بتر القائمة الخلفية كما أنه تم شرح العمليات الجراحية الخاصة بالبتر بالتفصيل وتم كذلك المقارنة بينهم •

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AMPUTATION OF THE PELVIC LIMB IN GOATS
(With 4 Figures)

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SUMMARY

Amputation of the pelvic limb was performed on 15 native breed goats. Different surgical procedures were applied, namely disarticulation at the hip joint, amputation at the mid femur and disarticulation at the stifle. The aim of this study is to explain whether the animal can tolerate the amputation or not and to establish the surgical procedures adopted in these conditions. The result of the present work proved that all operated animals tolerate well the operation and they were able to stand, walk, run and even jump without impediment. The details of the operative procedures were discussed.

INTRODUCTION

Amputation of the pelvic limb in goats is not a common surgical procedure especially at the last half of this century due to the improvement in the diagnosis and treatment of many surgical conditions affecting the pelvic limbs. However, when the condition of the limb threatens the life of the patient, the limb should be amputated.

Amputation of the pelvic limb was indicated in cases of acute trauma when the destruction is so severe that there is no hope for reconstruction of the limb function an event which usually happens in farms where goats are reared together

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with large animals like buffaloes and cattle which may tread over the small animals lying beneath them. Also presence of tumours, like osteosarcomas which may affect the femur or tibia, amputation is considered to be the only effective treatment. Moreover irreparable cases of nerve injuries with severe damage resulting in paralysis of the limb is another indication for amputation because the paralysed animal usually drags the affected limb on the ground exposing it to injury with subsequent infection. In addition the operation could be performed for a limited period of time for certain individuals supposed to be fattened for meat purposes or saved for breeding.

Different surgical procedures were applied for removal of the pelvic limb, namely disarticulation at the hip joint, amputation at the mid femur and disarticulation at the stifle joint. The aim of the present study is to explain whether the animal can tolerate the amputation or not, and to establish the surgical techniques adopted in these conditions in native breed goats.

MATERIAL AND OPERATIVE TECHNIQUES

Removal of the pelvic limb was performed on 15 adult native breed goats of different ages and sexes. The experimental animals were divided into three groups each by 5 animals. Disarticulation at the hip joint was done on the first group, amputation at the mid femur on the second and on the third group disarticulation at the stifle joint was performed.

All operations were done under effect of epidural anaesthesia using procaine hydrochloride 2% at the lumbosacral space in a dose varying between 6-10 ml according to the size of the

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animal. The animals, 15 minutes before induction of epidural anaesthesia, were premedicated by Rumpon (Bayer) as a tranquilizer in a dose of 0.2 mg/Kg b.w (0.01 ml.Kg. b.w. of 2% solution of zylazine hydrochloride). All operations were performed under strict aseptic conditions taking in consideration the general principles of asepsis and antisepsis.

1- Disarticulation at the hip joint:

The lateral and medial aspects of the thigh were prepared for aseptic operation and the leg was draped with sterile gauze so that it can be manipulated freely during the process of operation. The lateral skin incision was extended from the fold of the skin of the flank and passed downward and caudally in a curved manner crossing the mid femur and then upward and caudally to the tuber ischii. The medial skin incision extended in a straight line from the fold of the flank to the tuber ischii parallel to and 1 cm. from the inguinal crease. The two skin incisions were connected cranially at the fold of the flank and caudally at the tuber ischii. At the medial aspect of the thigh the skin was bluntly dissected to expose the femoral triangle. The space between the caudal border of the sartorius muscle and the border of the pectineus was exposed and the femoral blood vessels which are found in it were doubly ligated and severed together with the saphenous nerve. The sartorius, pectineus, gracilis and adductor muscles were transected respectively in a parallel line to the inguinal crease and 2 cm. from it. The medial circumflex femoral vessels were exposed near the iliopsoas muscle and doubly ligated and severed. Then the iliopsoas muscle itself was transected near its insertion in the lesser tubercle of the shaft of the femur.

The jointcapsule of the hip joint was incised medially, cranially, and caudally and the ligament of the head of the femur was transected.

At the lateral aspect of the thigh, the skin was bluntly dissected and reflected dorsally to expose the hip joint and the muscles of the lateral aspect of the thigh. The lateral cutaneous femoral nerve and the caudal branches of the deep circumflex iliac blood-vessels were doubly ligated and transected. The tensor fasciae latae and gluteobiceps were severed at about 6 cm. distal to the level of the hip joint and reflected dorsally to expose the sciatic nerve. The later was severed at its uppermost part to prevent its exposure at the seat of closure of the wound. The semimembranosus and semitendinosus were severed at the level of the hip joint and also the quadratus femoris was transected from its insertion into the femur distal to the intertrochanteric crest near the lesser trochanter. The gluteus medius and gluteus profundus were transected from the greater trochanter of the femur. The obturatorius externus and gemelli were severed from its insertion into the trochanteric fossa.

Cranially the tendon of origin of the rectus femoris was severed and also the femoral nerve was cut medial to it. The joint capsule was incised completely and the limb was removed. The acetabulum was covered by suturing the deep fascia covering the gluteobiceps to that of the gracilis and sartorius on the medial side. Then the superficial fascia and skin were closed in a routine manner.

2- Amputation at the mid shaft of the femur:-

Surgical preparation was the same as disarticulation at the hip joint. After positioning the animal on the operating

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table and draping the leg till the stifle joint, the skin incisions were made at the medial and lateral aspects of the thigh. The lateral skin incision extended from the fold of the skin at the flank region downward and caudalward towards the stifle joint till the level of the patella and then redirected in a curved manner caudalward and upward to end at the tuber ischii. The medial skin incision passed from the same fold of the skin at the flank was turned downward and caudalward to the level of the mid shaft of the femur then directed upward and caudalward in a curved manner to connect the lateral skin incision at the tuber ischii. At the medial aspect of the thigh the upper fold of the skin was bluntly dissected from the underlying muscles. The saphenous nerve and the femoral blood vessels were exposed between the sartorius and pectineus muscles and then doubly ligated and transected. The first group of muscles namely; sartorius, pectineus, and gracilis were transected at the level of the proximal third of the femur. The femoral nerve which enters between the rectus femoris and vastus medialis was cut. Also the second group of muscles; tensor fasciae latae, quadriceps femoris (rectus femoris, vastus medialis, vastus lateralis and vastus intermedialis) and gluteobiceps muscles were transected. The latter group of muscles were severed at a lower level than the first group accurately at the level of the distal third of the femur. The lateral cutaneous femoral nerve and the caudal branch of the deep circumflex iliac blood vessels which are lying on the medial aspect of the tensor fasciae latae, were doubly ligated and severed. At the medial aspect of the gluteobiceps muscle, the sciatic nerve was exposed and then transected. The nerve was severed at a level higher than the cut end of the gluteobiceps muscle

to prevent its exposure at the stump of the limb after amputation. The third group of muscles namely; semimembranosus and semitendinosus were transected at the same level of transection of the second group (at the distal third of the femur) then the adductor muscle was partially reflected from the caudal surface of the femur to the mid femur and the bone was severed by electric saw at the middle and thus the limb became free. The distal stump of the second group of muscles was drawn caudally to cover the stump of transected femur and sutured to the distal stump of the third group of muscles using fine number of catgut. The two edges of the skin were coaptated together using mattress or simple interrupted suture.

3. Disarticulation at the stifle joint:

Surgical preparation was the same as previously mentioned but the leg was draped till above the hock joint. The lateral and medial skin incisions were performed from the level of tibial tuberosity cranially and directed downward and caudally in a curved manner till the level of junction of the proximal and middle thirds of the tibia. Then they were directed upward and caudalward to connect each other at the level of the caudal surface of the femerotibial joint. The skin in both sides was reflected upward till the stifle joint. Cranially the middle patellar ligament was severed at its attachment into the tibial tuberosity. At the lateral aspect of the stifle joint the insertion of the gluteobiceps muscle was carefully transected due to the presence of the fibular nerve which lies medial to it. The nerve was followed upward and severed at a higher level than the muscle. The lateral head of gastrocnemius

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was resected at the level of junction of the proximal and middle thirds of the tibia, then the flexor digitorum superficialis. The tibial nerve and popliteal blood vessels thus became clear. The blood vessels were doubly ligated and severed but the nerve was followed upward and cutted at a higher level near the stifle joint. Then the medial head of gastrocnemius was transected at the same level of the lateral one. At the caudal surface of the stifle joint the tendinous origin of the popliteus muscle and extensor digitorum longus and fibularis terius were transected. The femerotibial joint was penetrated below the level of the menisci and its ligaments and the cruciate ligaments were severed, thus the leg became free. The distal stump of the two heads of gastrocnemius muscle was drawn cranially to cover the distal extremity of the femur and sutured to the distal end of the middle patellar ligament. The skin in both sides was coappitated together using mattress suture and mersilk No. 2.

RESULTS AND DISCUSSION

All operated animals tolerated well the amputation or disarticulation of the pelvic limb. They were able to stand on three limbs directly after disappearance of the effect of anaesthesia. Few hours after the operation the animal began to walk on three limbs with little stumbling. Few days after the operation the animals could walk, run and even jump without any impediment. They already accustomed to ambulation, including getting up and down with three limbs (Fig. 1-3).

Limb amputation is a form of treatment that has a limited application in veterinary surgery. Many authors discussed amputation for disarticulation of the limb in different domestic

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animals(OEHME and PRIER, 1974 in horse; FANK,1959 & ESPERSEN , 1961 in cattle; MISK, ABDEL-RAHEAM and HIFNY, 1979 in goats; and HICKMAN, 1964, ARCHIBALD, 1965, HICKMAN and WALKER, 1973 and BARCLAY SLOCUM 1975 in dog).The available literature lacks any observation about the amputation of the pelvic limb in goats.

In the present study different techniques for amputation or disarticulation of the pelvic limb were discussed. Every technique described in the present work has some advantages and disadvantages, as regards to the time consuming during the operation, the amount of resected muscles, the invasion of joint capsule or cutting of bone and lastly the cosmetic appearance of the animal postoperatively. The choice of technique depends mainly upon the degree of damage and its level in the limb. Disarticulation of the limb at the hip joint is usually performed when severe damage occurs and includes all the pelvic limb. This technique of operation is so simple as might be suspected, only the operation consumes more time than other techniques. Also the genitalia or udder appeared to be exposed after completion of the operation. The healing process of the wound in this technique proved to be excellent and occurred without any complication.

Amputation at the level of the mid femur was an operation which can be performed in a lesser time than that of disarticulation at the hip joint. Also the amount of resected muscles were less than disarticulation. Genitalia and udder are still exposed as in cases of disarticulation simply because the proximal part of the femur is present in a condition of flexion of the hip joint and appears parallel to the lateral side

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of the pelvic wall. Also cutting of the femur at its middle may expose it for infection and osteomyelitis. However, this complication was not recorded in the present study and the stump of the femur healed with a new bone formation (Fig. 4). The stumps of the resected muscles were reinserted at the distal end of the remaining part of the femur.

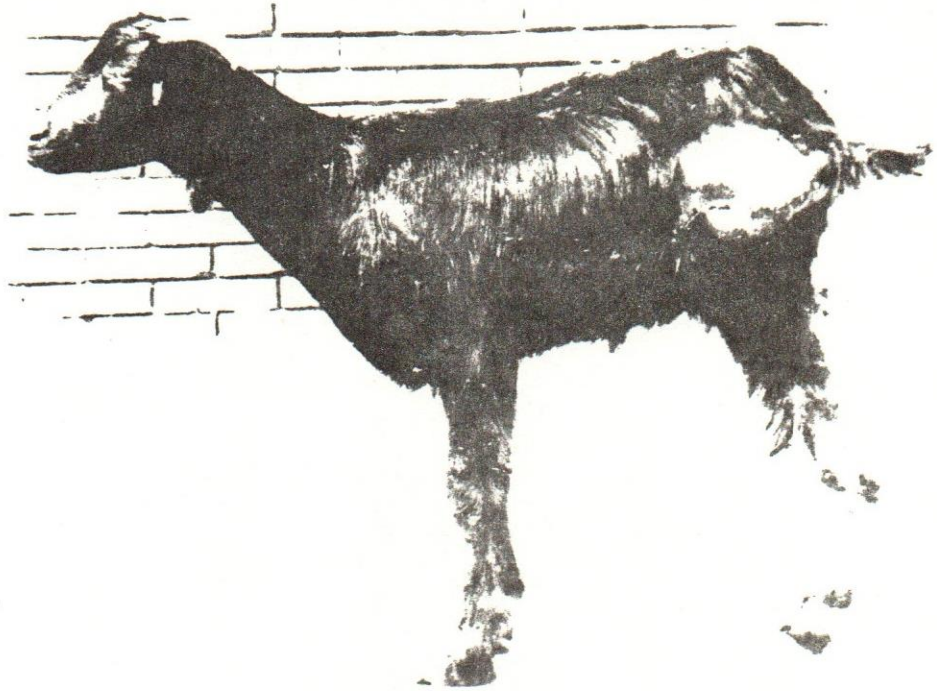
Disarticulation at the level of the stifle was performed when the degree of damage was limited to the leg and distal to it. This operation was completed in a lesser time than disarticulation at the hip or amputation at the mid femur. The amount of resected muscles reduced to the minimum and the operation could be performed without any complication. In this condition the external genitalia or udder partially hidden and protected from external trauma.

In brief, when the degree of damage is severe and including all the limb, disarticulation at the hip was recommended. When the trauma is limited to the leg, disarticulation at the stifle assumes to be better than amputation at the mid femur.

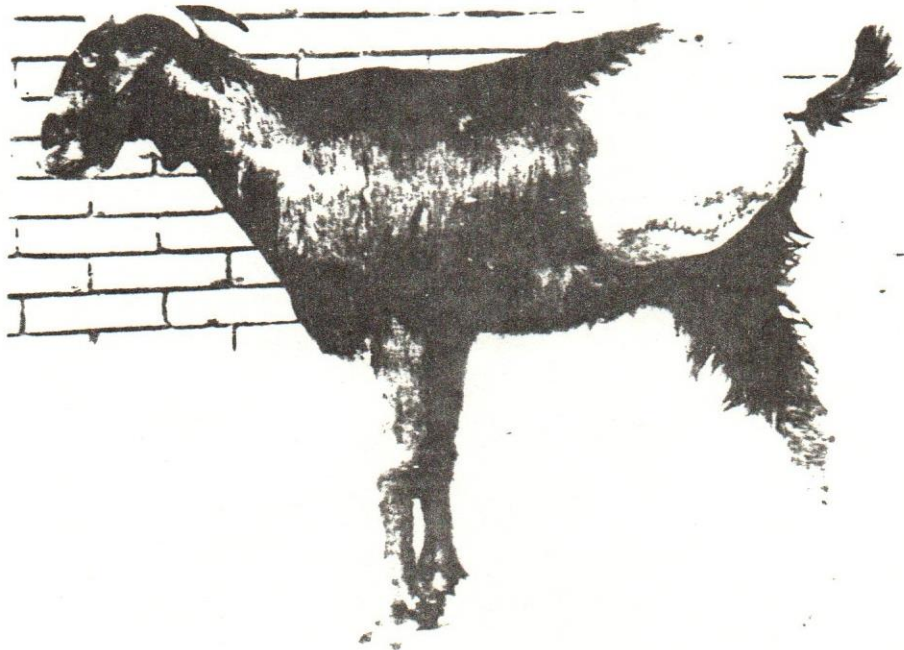
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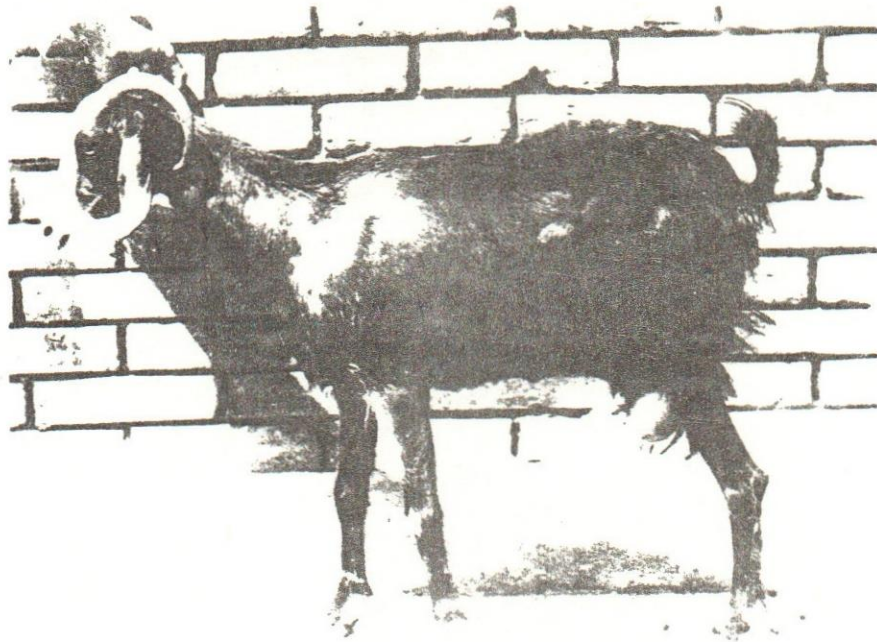
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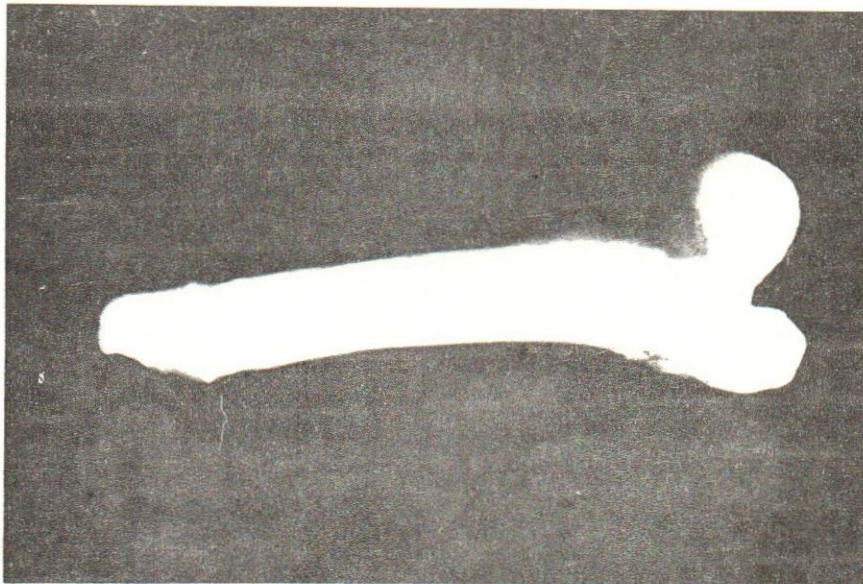
(Fig. 1): Disarticulation of the pelvic limb at the hip joint, one week after the operation.



(Fig. 2): Mid femur amputation of the pelvic limb, one week after the operation.



(Fig. 3): Disarticulation at the stifle joint of the pelvic lumb, two weeks after the operation.



(Fig. 4): Showing the obliteration of the stump of the femur with new bone formation, two months after the operation in mid femur amputation in a goat.