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صورة الدم بعد بتر احدى القوائم فى الماعز

أحمد القباني

تم بستر احدى القوائم فى ثمانية ماعز لدراسة تأثير هذه العملية الجراحية على السدورة الدموية . ولقد وجد ان هناك زيادة فى الحجم الكلى للدم . وكذلك الحجم الكلى لخلايا الدم الحمراء بالاضافة الى زيادة حجم الخلايا الدموية المصنفة فى الحيوانات التى استئصلت نواصيها بالمقارنة بالضوابط . بينما لم يتأثر الحجم الكلى للبللازما .

ERYTHROPENIC EFFECT OF LIMB AMPUTATION IN GOATS (With One Table)

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SUMMARY

Amputation of the limb was performed in 8 goats to study its effect on the blood circulation. There were an increase in the whole blood volume, whole erythrocyte mass as well as the haematocrit, while, the whole plasma volume remains within the normal.

INTRODUCTION

Amputation of limbs is not a common surgical procedure. It is mostly performed to save the life of the patient. It is not well known whether this operation affects the blood circulation or not. Most surgical operations with removal of a portion from the body, such as small bowel resection or splenectomy, are associated with reduction in the red cell volume while plasma volume either remained unchanged or decreased (CUTHBERTSON *et al.*, 1970 and BOLBOL and MISK, 1979).

The circulating blood volume was mainly diminished due to removal of a portion of the total vascular bed (BREZIN and OREN, 1945).

The aim of the present work is to study the erythropenic effect of amputation of a limb in goats.

MATERIAL and METHODS

Twelve adult native breeding goats of different ages were included in the study. They were divided into three groups:

- Group (1): Four animals subjected to amputation of the thoracic limb (Disarticulation at the shoulder joint) by the method described by MISK *et al.* (1979).
- Group (2): Four animals with amputation of the pelvic limb (Disarticulation at the hip joint) performed after MISK and HIFNY (1979).
- Group (3): Four goats were left as control animals.

Two blood samples were taken from each animal one before the operation and the second two years after operation. The following blood tests were performed: Haematocrit (HCT), R.B.Cs. count, Haemoglobin concentration (Hb), M.C.V., M.C.H. and M.C.H.C. using the methods described by COLES (1980). Whole blood volume, whole plasma volume and whole erythrocyte mass (using Evans Blue-dye-T-1824) were determined according to the method of MAILE (1972).

RESULTS

All animals tolerated well the amputation and they were able to stand, walk and even run on three limbs few days after operation. The animals showed an increase in their body weight more than before operation. Table (1) summarizes the blood picture of goats, for both control animals and before the operations of amputation. The table also reveals the variations in blood parameters of goats two years after operation.

DISCUSSION

Amputation of a limb, in general, is considered the last resort in some cases of trauma when the destruction is so severe that there is no hope for reconstruction of the limbs function. In addition, MISK and HIFNY (1979) mentioned that the operation could be performed in the presence of malignant tumours, like osteosarcoma-

mas of the femur, or irreparable cases of nerve injuries with severe damage. This operation is almost never an operation of choice, but preservation of the functioning tissues is the main objective of surgical treatment for such affection.

The available literature lacks any informations about haematological picture after amputation of limbs especially in goats. It is well known that when a part or an organ is removed from the body, a compensatory mechanism takes place in the corresponding portion. In this manner, MISK *et al.* in(1979), performed complete amputation of the thoracic limb in goats. Their electromyographic studies of some muscles of the contralateral limb showed a significant increase in their electropotential activity, a fact which allowed the condition of the animal to be healthy throughout his life.

Contrary to our expectations, it was shown that the circulating blood volume increased about 7-16.5% and at the mean time the red cell mass of blood circulation was elevated to a greater percentage, reaching 35.33%. This was an indication of great success to compensate the defect which occurred as well as the hypertrophy in the corresponding limb which needs more blood supply. This notice was in agreement with BOLBOL's view in 1977 that under favourable condition of diet and life, hypertrophy occurred in the remaining portion secured a functional adjustment nearly like that of a normal animal. This observation also confirms the result of MISK *et al.* (1979) in that there is a significant increase in the potential activity of muscles of the contralateral limb.

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Blood parameters of control and goats with limb amputation

	Normal	Hind-limb	Fore-limb
HCT (%)	26.50±0.21	31.00±2.10	32.00±0.05
R.B.Cs. (mil./ccm)	10.17±0.42	10.00±0.18	10.19±0.11
Hb (gm. %)	5.10±0.03	5.52±0.16	5.94±0.01
M.C.V. (cum)	26.06±0.36	31.43±3.22	31.17±0.31
M.C.H.C. (%)	19.26±0.35	17.88±0.72	18.44±0.06
M.C.H. (uug)	5.02±0.05	5.52±0.31	5.80±0.11
Plasma Volume (ml/kg)	62.65±4.62	69.80±4.33	63.19±7.60
Blood Volume (ml/kg)	79.72±8.40	92.90±3.32	85.29±8.35
Red Cell Mass (ml/kg)	17.07±1.47	23.10±0.82	22.10±2.16