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الاستئصال الجزئي للطحال في الحمير

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تم استئصال 3/4 الطحال في 11 حمار. وللحصول للطحال استئصال جزء من الطحال رقم 17 في 10 حيوانات وفي الحالات السبعة الباقية كان الطحال متضخمًا فتم استئصال جزء من الطحال الثامن عشر بالإضافة للقطع السابع عشر. هذا ولم يصاحب الاستئصال الجزئي للطحال تغيرات جوهرية في عدد كرات الدم الحمراء وكذلك في تكسيره.

الهيماتوكريت

ولقد أوضحت الدراسات الهيستو-pathولوجية أن جرح الطحال الذي تم خياطته قد انتشر بواسطة نسيج ضام والذي حل تدرجياً محل التنكرز الذي حدث في بعض أجزاء من الجرح. بعد أربعة أسابيع وضع أن الجرح قد التتائم تماماً ولم يتأثر خلايا باتئـن الطحال بالعملية اطلاعاً مع وجود التصاقات قوية بين بقية الطحال والخلايا البروتيني والشرب.

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PARTIAL SPLENECTOMY IN DONKEYS
(With One Table & 7 Figures)

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SUMMARY

Partial splenectomy (1/3) was performed in 16 donkeys, after resection of 17th rib (10 cases) and 17th and 18th rib (6 cases). Non-significant changes in total R.B.Cs. count and haemostic value while significant increase in total W.B.Cs. were recorded.

Histopathological studies showed that the sutured spleen healed by granulation tissue that replaced gradually the necrotic foot which appeared during the first two weeks of the experiment. After four weeks, healing was complete and strong adhesions between the spleen, omentum and the peritoneum were noted.

INTRODUCTION

Total experimental splenectomy had been successfully performed in donkeys. The operation was said to be indicated for reticuloendothelial alteration for blood parasite studies. Clinical application for this technique appeared quite limited as in cases of neoplasms, rupture, torsion and hypersplenism (TANTAWY, BOLBOL and SAMY, 1981; EL ZOMOR, 1985 and RIGG, REINERTSON and BUTTRICK, 1987). It was well known that splenectomy was associated with increased susceptibility to infection 540 times greater than usual (COLN et al., 1983). However, because of the complications of infection, attempts were undertaken to repair rather than to remove injured spleens. Various surgical techniques had been described for repairing injured spleen including suturing (EL-MOTTALIB et al., 1980), ligation of the splenic arteries (CONTI, 1980) and applying local haemostatic agents (MORGENSEN, 1977 and COLN et al., 1983).

The aim of the present work was to evaluate the effectiveness of suturing lacerated spleen after partial splenectomy. At the same time, the haematological changes that might take place post-operatively as well as the histopathological changes occurring at the suture line besides the physiological changes at the rest of spleen were recorded.

MATERIAL and METHODS

Sixteen donkeys of 150-250 Kg body weight and 3-6 years old were subjected to partial splenectomy under the effect of Rompun-Saffan combination anaesthesia (GOHAR et al., 1988). Rompun was administered i.v. at a dose rate of 0.2 mg/Kg b.wt and Saffan at a dose rate of 4 mg/Kg b.w. Each animal was casted on its right side before administration of anaesthesia and the left thoraco-abdominal wall was prepared for aseptic surgery.

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+ : Rompun, product of Bayer, Germany.

One bold cutaneous incision of 20-25 cm in length was made over the 17th rib from 5 cm dorsal to the margin of the ilio-costalis muscle to the costochondral junction. The periosteum was incised and reflected and the rib was then cut dorsally using embryotomy saw and tracted ventrally from the cartilage. The spleen was exteriorized following the technique of EL ZOMOR (1985). Splenic vessels supplyin the lower third were double ligated and severed inbetween. The spleen was then cut removing the lower third. The protruded portion of the splenic tissue was then pressed intracapsular by fingers to leave appropriate edges of the capsule to be sutured and tightly closed using simple continuous suture by cat gut No. 1 (Fig. 1). The peritoneum and abdominal muscles were sutured using chronic cat gut No. 1. Finally the skin was closed as usual. In 6 cases, the spleen was enlarged so that it required resection of the 18th rib in combination with the 17th one.

Blood samples were collected from the jugular vein at one week interval till the end of the experiment to study any changes in either the erythrocytic or leucocyctic count together with the haematocrite value.

Three animals were sacrificed at the same intervals. Macroscopic examination of the spleen remnant was recorded. Specimens from the suture line and the surrounding areas were taken for histopathological examination. Sections from each specimen were sliced at 4 U thickness and stained by Harris hematoxylin and eosin (HARRIS, 1898).

RESULTS

All operated donkeys tolerated the anaesthetic regimen and the operation as well. Pneumothorax had not been encountered in any case.

Table (1) shows the haematological findings throughout the experiment. There was insignificant decrease in total R.B.Cs. count and haematocrite value during the experiment, while the total W.B.Cs. count was significantly increased throughout the experimental period.

Table (1): R.B.Cs. count, total W.B.Cs. count and the haematocrite value throughout the experiment.

<table>
<thead>
<tr>
<th></th>
<th>R.B.Cs. 10/cmm</th>
<th>Haematocrite value%</th>
<th>W.B.Cs. 10/cmm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Week after operation</td>
<td>5.93±0.41</td>
<td>31.72±0.48</td>
<td>9.52±0.28</td>
</tr>
<tr>
<td>2 Weeks after operation</td>
<td>5.65±0.41</td>
<td>31.98±0.84</td>
<td>9.84±0.32**</td>
</tr>
<tr>
<td>3 Weeks after operation</td>
<td>5.68±0.22</td>
<td>31.98±0.74</td>
<td>10.38±0.28**</td>
</tr>
<tr>
<td>4 Weeks after operation</td>
<td>5.72±0.28</td>
<td>32.12±0.86</td>
<td>10.60±0.24**</td>
</tr>
<tr>
<td>Before operation</td>
<td>5.82±0.33</td>
<td>32.98±0.92</td>
<td>9.84±0.34</td>
</tr>
</tbody>
</table>

* expressed as mean and standard error.
** P<0.01

The splenic wound showed apparent good healing two weeks post-operatively, however, some pieces of non-absorbed cat gut sutures were still in situ. After 4 weeks, there were very strong adhesions between the suture line, the parietal layer of the peritoneum and the omentum (Fig. 2). Non of the cases showed any noticeable infection.

The histopathological study of the sutured splenic wound showed granulation tissue formation overlying the splenic capsule along the course of the operation (Fig. 3, 4 and 6). Two weeks post-operatively, mononuclear leucocytic inflammatory cells and erythrocytes infiltrated locally the healed tissues (Fig. 4). Focal areas of splenic tissue underneath the capsule

were found losing their normal infiltrated by dead neutrophils (Fig. 5). Other splenic areas
looked histologically normal. Adipoblasts were penetrating the granulation tissue at the 2nd
and 3rd weeks (Fig. 6), however, they disappeared on the 4th week. Mononuclear leucocytic
inflammatory cells were observed in diffuse manner inbetween the adipose cells (Fig 6 and
7).

DISCUSSION

In the present work the surgical technique applied for splenectomy on right recumbent
position proved to be efficient and passed without any difficulty to exteriorize the spleen
and locate the splenic vessels. This could be attributed to the action of the used anaesthetic
regimen which minimized straining resulting in reduced intraabdominal pressure which facilitated
the intestinal manoeuvres during the said operation. However, TANTAWY et al. (1981) preferred
to carry on total splenectomy in donkeys in standing position.

From the obtained results, it was quite clear that partial resection of the 17th rib
provided an easy access to the spleen and its vessels, a finding which coincided with that
reported by DENNING and BROCKLESBY (1965) and TANTAWY et al. (1981). When the spleen
was abnormally enlarged, partial resection of the 18th rib in addition to the 17th one resulted
in better exposure of the organ. EL ZOMOR (1985) recommended the same procedure in recumbent
position. However, RIGG; REINERTSON and BUTTRICK (1987) resected the 16th rib and
incised the diaphragm to reach good exposure of the splenic vessels and attachments. In the
meantime, pneumothorax which was reported by DENNING and BROCKLESBY (1965) as a
common complication was not met with in the present work.

The results showed that there was insignificant decrease in R.B.Cs. count and haemato-
critie value. This ment that the function of the spleen was not disturbed by partial splenectomy.
However, PEACOCK' and MANTON (1963) and ELENS et al. (1964) mentioned that total splenec-
tomy should be followed by variou degree of drop in R.B.Cs. count and haematocritie value
because of the role of spleen in the formation of R.B.Cs. Moreover, the authors recorded a
significant increase in total W.B.Cs., a result that agreed with IBRAHl et al. (1980) after
total splenectomy in sheep and EL ZOMOR (1985) in donkeys.

Histopathological findings showed that the sutured area was filled by granulation tissue
overlying a thickened fibrous tissue capsule from the first week of the experiment and per-
sisted till the end of work. This finding was parallel to the observations of NORMAN and
CHEVILLE (1983) concerning with healing of the surgical wound. Moreover, ligature and
haemostasis were observed early at the 2nd week in the underlying area of granulation
tissue along the splenic pulp. JONES and HUNT (1983) attributed such changes to the autolysis
and heterolysis of the dead cells.

At the second week, newly formed granulation tissue was found penetrated by surround-
ing adipose cells, mononuclear leucocytic inflammatory cells and erythrocytes as a defence
mechanism from the animal body against the surgical interference. The results of histopatho-
logical examination of splenic area faraway from the area of surgical interference showed
no pathological changes from the begining.

In conclusion, surgical trials for performing partial splenectomy, whenever indicated,
could be successfully carried out in equines. Quite clear, the size and lobulation of the organ
in such species paved way to the easiness of the mentioned surgical procedure.
REFERENCES


LEGEND OF FIGURES

Fig. (1): Suturing of the splenic capsule using simple continuous sutures and cat gut No. 0.

Fig. (2): Apparent good healing of the splenic wound and the adhesions between the capsule and the omentum. 4 weeks after operation.

Fig. (3): Granulation tissue formation overlying the splenic capsule. One week post-operatively H & E X 40.

Fig. (4): Area of granulation tissue infiltrated by leucocytic inflammatory cells and erythrocytes. 2 weeks after operation H & E X 100.

Fig. (5): One of the focal areas that showed liquefacitive necrosis underneath the splenic capsule. 2 weeks post-operatively H & E X 100.

Fig. (6): Granulation tissue infiltrated with adipoblastic cells and leucocytic inflammatory cells. 3 weeks post-operatively. H & E X 40.

Fig. (7): Adipoblastic cell penetration, mononuclear leucocytic inflammatory infiltration and extravasated erythrocytes in the area of granulation tissue. 2 weeks post-operatively H & E X 100.