

## دراسة مقارنة للطرق الجراحية المختلفة لازالة الطحال في العجول وخصوصا بالنسبة للطريقة التي تجرى بين الضلعين الأخيرين

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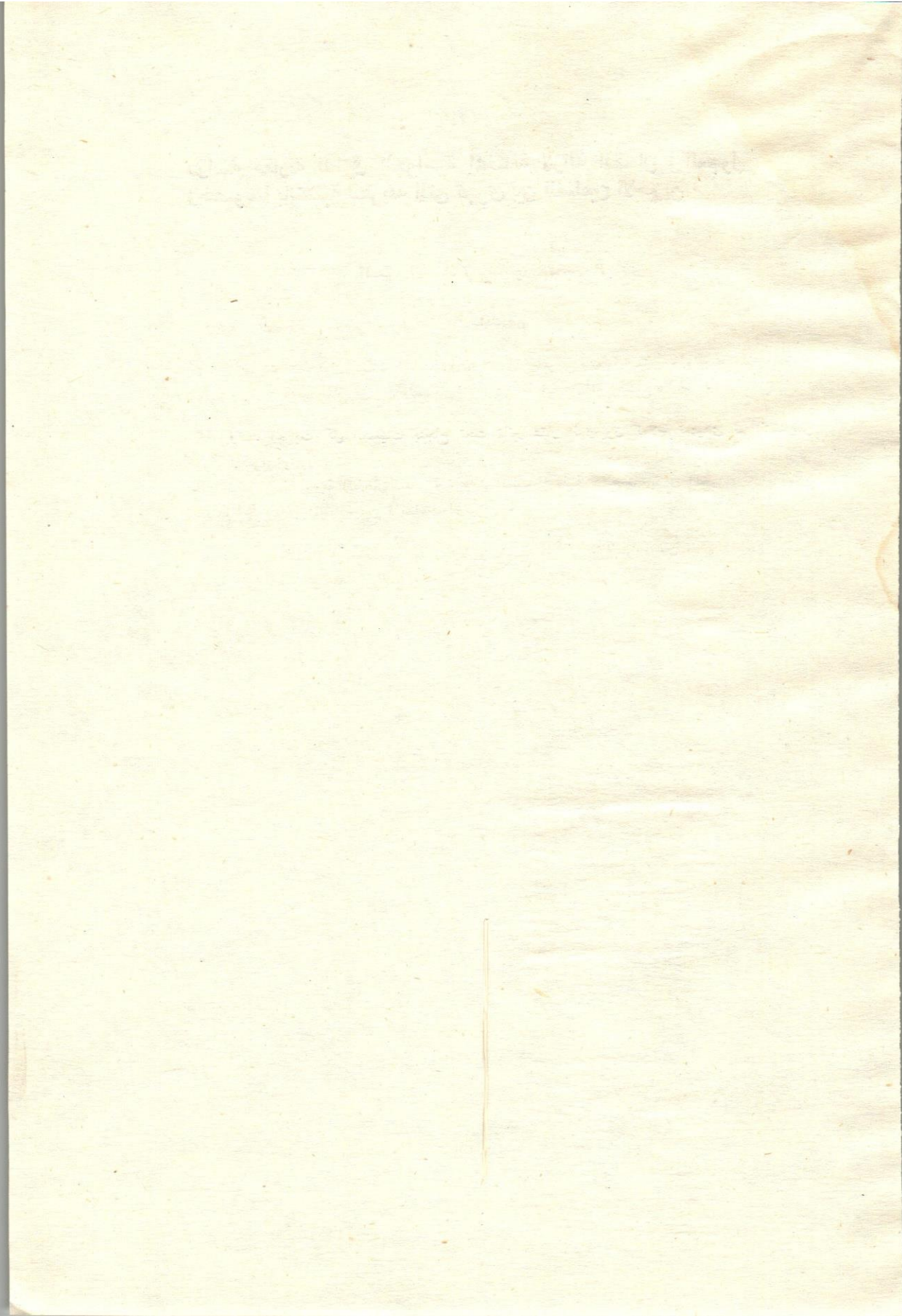
### الملخص

جررت ثلاث طرق لازالة الطحال في ٩ عجول جاموسى وعجول بقرى واختير مكان العملية ليكون موازيا لآخر ضلع أو بين الضلعين الأخيرين أو بعد ازالة الضلع الأخير .

وقد أجريت كل العمليات بنجاح تحت تأثير عقار الرومبون كعلاج تمهيدى ثم التخدير حول الفقرات . وقد ثبت أن أسهل عملية لازالة الطحال تكون بعد ازالة آخر ضلع لأنها توفر حيز كاف لربط أوعية الطحال الدموية . وقد أعطت العملية نتائج باهرة في الحيوانات الصغيرة حينما أجريت في المسافة بين الضلعين الأخيرين .

وان اختيار مكان العملية موازيا لآخر ضلع غير مريح للجراح لأن مكان الطحال يقع بعيدا الى الأمام من هذا الموضع .







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**COMPARATIVE STUDY OF THE DIFFERENT SURGICAL  
TECHNIQUES USED FOR SPLENECTOMY IN CALVES WITH  
SPECIAL REFERENCE TO THE OPERATION PERFORMED  
BETWEEN THE LAST TWO RIBS.**

(3 figures)

By

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(Received at 5 - 11 - 1973)

**SUMMARY**

Three techniques for splenectomy in nine buffalo calves and cow calves were tried. The operation sites selected were parallel to the last rib or between the two last ribs and after resection the last rib.

All operations were successfully performed under the effect of Rumpon premedication and paravertebral anaesthesia.

The easiest way for splenectomy in these animals was after resection of the last rib because it gave enough space for ligating the splenic vessels. Excellent results were obtained when the operation was performed between the last two ribs in young animals. The operation site just caudal and parallel to the last rib was comfortable of the operator, owing to the fact that the spleen is situated far away cranially from this seat.

**INTRODUCTION**

It is generally accepted that calves have a degree of natural resistance to anaplasmosis infection, but when splenectomized they become highly susceptible to the infective agent. Splenectomized calves are used in the anaplasmosis antigen production as well as for subinoculation diagnostic tests. Splenectomy is also employed to detect the presence of infection in carrier animals by provoking a relapse. For these reasons as well as for need of veterinarians working on babesiosis and other blood parasites of ruminants, we thought for an easy way to extirpate the spleen.



The First excision of the spleen dates back to 1549. The operation was stated to be performed on a greek woman by ZACARELL WAR THIN (1903) splenectomized a number of sheep and goats and reported that about 50% went into shock following the operation and died. In 1926 DEKOCK and QUINLAN performed successfully the operation on horses, cattle, sheep and goats.

WITZEL and MULLENAX (1964) tried with success the operation in horses using promazine as a premedication followed by administration of Halothane-oxygen mixture using a closed circle system. Their technic involved partial resection of the 16th, 17th and 18th rib, as it provides easy access to the spleen and good visibility to the surgical field.

Another technic for splenectomy in calves was described by PEACOCK and MANTON (1963) with the animals in the standing position using local anaesthesia. Section and haemostasis of the splenic vessels were performed by means of the ecraseur. DENNIG and BROCKLESBY (1965) described a simple technic in horses and donkeys after resection of the 17th left rib using chloral hydrate as an anaesthetic. GATES (1953) performed the operation in cattle in the recumbant position under the effect of 4.0% chloral hydrate anaesthesia given intravenously at a rate of 0.15 cc per lb body weight. The author stated that the incision is made a few inches posterior and parallel to the last rib in calves, but in adult cattle it should be made close to the posterior border of the last rib to make it easy for the operator to reach the apex of the spleen.

#### MATERIALS AND METHODS

The materials included in this work were five buffalo calves and four cow calves of both sexes ranging in age from 9 months to 2 years.

From the 5 buffalo calves 3 animals were operated upon between the last two ribs, while the other 2 splenectomized after resection of the last rib. From the cow calves, one animal was operated just caudal and parallel to the last rib at the seat of rumenotomy, another one was operated on between the two last ribs and the last 2 calves were operated on after resection of the last rib.

All animals were fastened 24 hours before operation ; but water was only allowed. The operations were performed under the effect of paravertebral anaesthesia by injecting 20 ml. 3% procain Hcl, perineurally around



each nerve. This was preceded by Rompun (Bayer) as a premedication given intramuscularly in doses ranging from 0.6-1 ml. according to the weight of the animal.

An area of about 40 cm square on the left flank was shaved and disinfected with tincture iodine. An incision was made in the skin just after the last rib and parallel to it or in between the two last ribs or just over the last rib according to the chosen seat. The muscles and peritoneum were then incised enough to admit the arm i.e. about 20 — 25 cm. The right hand was inserted into the incision and passed forward along the rumen until it reached the spleen.

By gentle forcing the fingers between the rumen and spleen, the operator was capable to break down the connective tissue which attaches the spleen to the rumen. Ligation of the splenic blood vessels could be performed while it was inside the abdominal cavity, using catgut or it was better to draw the spleen through the incision with its blood vessels still intact by using gentle traction and careful manipulation (fig. 1). After applying two catgut ligatures around the splenic artery and veins, a cut between these two ligatures was done and the spleen was removed. In performing the operation between the 2 last ribs (fig. 2) the skin and intercostal muscles were incised and then the peritoneum. By this method the operation site became nearer to the spleen.

The space between the two last ribs was not wide enough to permit good manipulation, but when a wound dilator was used it could be widened enough owing to the flexibility of the ribs especially in young animals (fig. 3).

In the third technique, splenectomy was performed after partial resection of the last rib, the incision was done over the last rib, where about half of its length was resected. The underlying muscles and peritoneum was sutured by simple continuous suture using catgut No 1.

The muscles were then sutured by catgut No. 3 using simple interrupted sutures and the skin with silk mattress sutures. On the 10th day the skin sutures were removed and healing per primum was the rule in all operations.

#### RESULTS AND DISCUSSION

All operated animals withstood the operation very well and were willing to take their food just after operation.



Functions of the heart and lungs were not affected as no marked variations from the normal ; throughout the operation time as well as afterwards ; could be noticed.

The use of Rompun (BAYER) ; in doses ranging from 0.6 ml - 1 ml. according to the weight of the animal as a premedication before praverterbral anaesthesia ; was excellent as all animals tolerated well the operation under its effect without any reaction. One animal, given a dose of 0.7 ml. Rompun, was unable to stand and fell down just after starting, so the operation was completed in the casting position. GATES (1953) claimed that he obtained good results by operating cattle under chloral hydrate anaesthesia in the casting position.

In the present work it was somewhat difficult to operate in the casting position owing to the supervening rumenal tympany as what had been noticed in the aforementioned calf which fell down. The arrest of haemorrhage from the splenic blood vessels was better controlled by ligature. In my opinion it is not advisable to use the ecraseur as a mean of controlling haemorrhage from the splenic vessels as mentioned by PEACOCK and MANTON (1963), owing to the fact that the splenic vessels are large in caliber and the crushing might not be enough to arrest haemorrhage permanently.

Fastening the animals 24-36 hours before the operation was of importance as it facilitated pulling out the rumen caudally to have a better view of the spleen and its vessels.

WITZEL *et al.* (1964) splenectomized horses by partial resection of the 16th and 18th ribs, while DENNIG *et al.*, (1965) recommended resection of the 17th rib in the same animal as well as in donkeys. It is well known that the diaphragm is attached partially to this rib and completely to the 16th rib, hence a pneumothorax is liable to occur or even collapse of the lungs.

In the present technique where resection of the last rib was performed, the diaphragm was not opened because it is not attached to it, therefore there was no fear from this complication.

Concerning the operation site, it is important to mention here that the easiest and best way for splenectomy in buffalo and cow calves was done after resection of the last rib. The procedure by this method gave us enough space to ligate the splenic blood vessels. The operation is more



comfortable by this technique in buffalo calves owing to the fact that the width of the last rib in buffaloe calves ranges from 5- 7cm., while that of cow calves ranges from 3-4 cm. Therefore, in buffaloes the space encountered after resection of the last rib is wider than in cows, hence, the manipulation of the spleen and its blood vessels was much easier. The only disadvantage of this technique is the excess of time needed for resection of the rib.

Excellent results had been also obtained when the operation was made in the space between the two last ribs, especially in younger animals. The flexibility of the ribs in young animals helped in a wide dilatation, enough to manipulate and operate easy as seen in fig. (3). It is worthy, here, to mention that it is contra-indicated to operate adult animals in the space between the two last ribs, because of the large size of the spleen and the less flexibility of the ribs. In such cases the best way for splenectomy is to resect the last rib.

The operation site just caudal and parallel to the last rib was the worst and the more difficult seat for splenectomy as the spleen was far away cranially and had to be removed with difficulty.

In the recumbant position the resulting tympany during the operation was an obstacle in ligating the splenic blood vessels. The rumen got ballooned and bulged through the laparotomy wound and an assistant had to press with his hands to reduce the typanic rumen inside the abdominal cavity in order to get hold of the spleen.

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Fig. 1.—The spleen was drawn using gentle traction through incision just after the last rib.

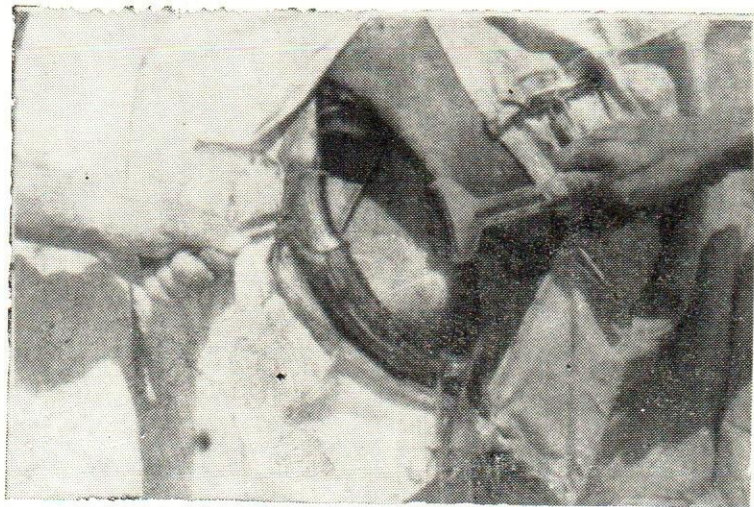
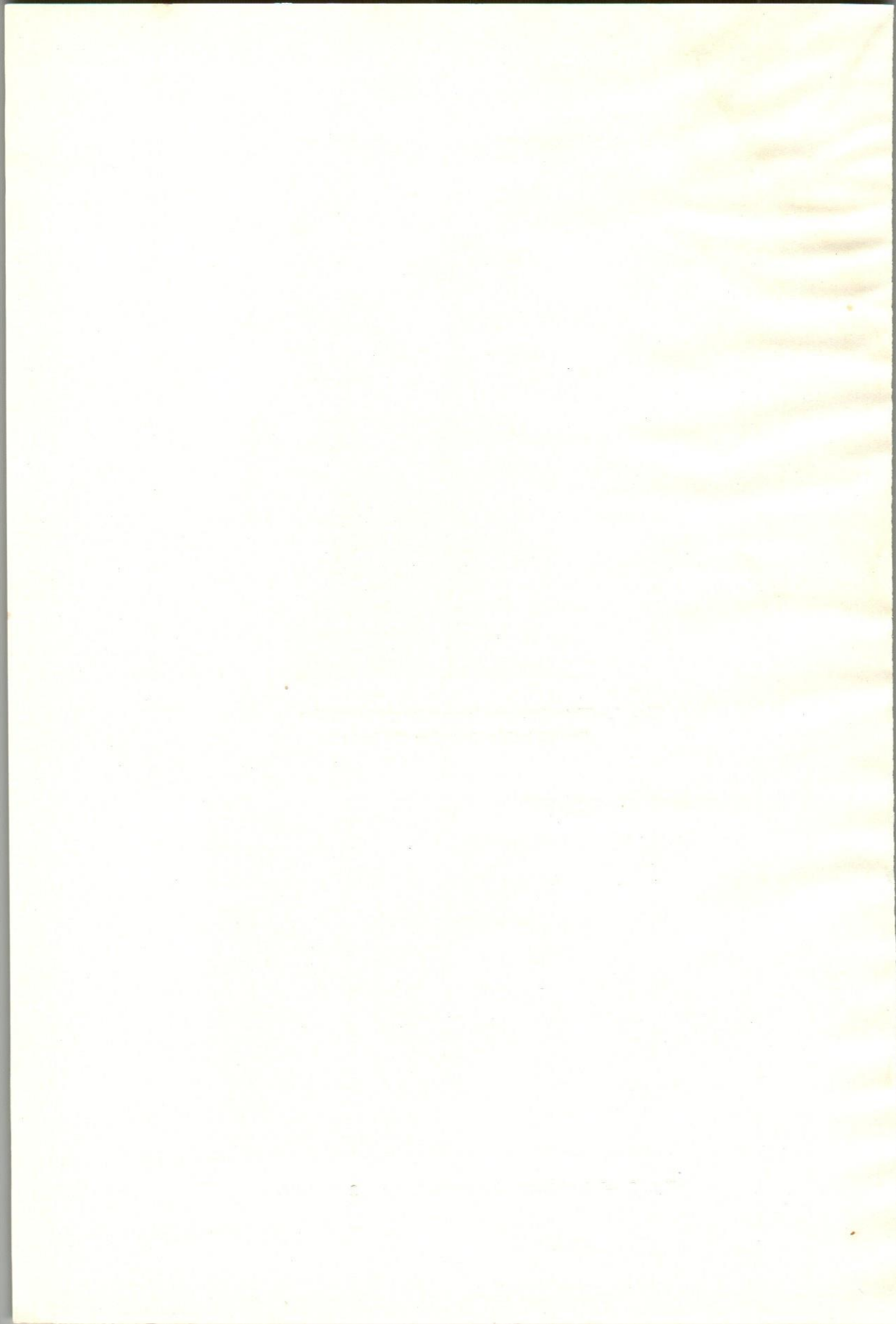


Fig. 2.—Splenectomy with removal of the 2 last ribs.



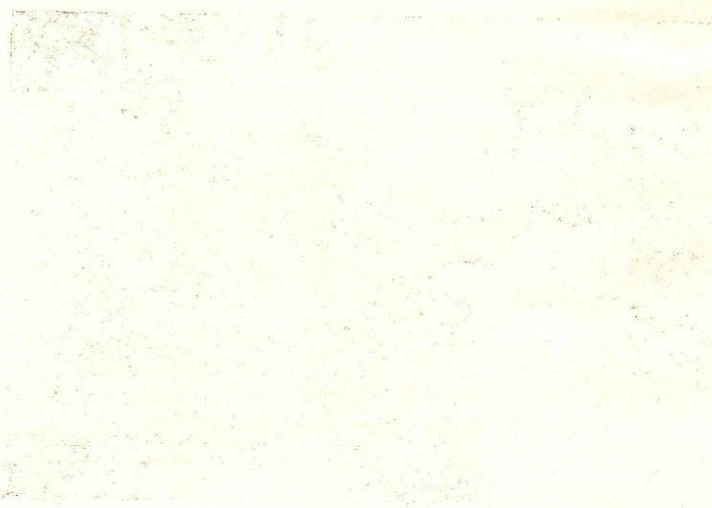






**Fig. 3.—Using wound dilator, enough space was given for manipulation.**





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