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TREATMENT OF AN ACQUIRED ABDOMINAL HERNIA IN A POLAR BEAR (*Thalarctos maritimus*)

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Abstract: A heart rate radio-transmitter was surgically implanted in the abdomen of a captive adult male polar bear (*Thalarctos maritimus*), but within five weeks a purulent discharge was observed at the incision site. The transmitter was surgically removed along with many fragments of the fractured encapsulation material. The skin incision healed, but a large hernia remained. Repeated localized trauma to the hernia sac necessitated surgical repair.

INTRODUCTION

The Naval Arctic Research Laboratory, Barrow, Alaska, maintains a research colony of arctic mammals which includes a 450 kg male polar bear (*Thalarctos maritimus*). The bear was captured as a cub in May, 1966 and his experimental usage has included surgical implantation of intraperitoneal heart rate radio-transmitters.^{1,4}

CASE REPORT

In July, 1974 a radio-transmitter with a hard wax-type coating was sutured against the peritoneal surface of the ventral abdominal wall.

Within five weeks purulent exudate was draining from the incision. The authors' initial contact with the bear was 10.5 weeks post-implantation when the

animal was anesthetized for examination. Induction was accomplished with a mixture of phencyclidine⁵ (800 mg) and acetylpromazine⁶ (20 mg) administered via dart pistol.⁷

The draining tract extended 2 cm dorso-laterally from the cranial aspect of the previous incision to one corner of the transmitter. Surgical exploration was indicated, and the bear was placed on ether maintenance anesthesia. Ether was administered through a cone⁸ which fit over the muzzle and snugly against the face.

The transmitter was removed through a ventral midline incision along with many fragments (less than 2 mm) of transmitter coating material. The site was flushed with potassium penicillin G and the incision closed.

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² The opinions or assertions contained herein are the private views of the authors and are not to be construed as official or as reflecting the views of the Department of the Army, the Department of the Navy, or the Department of Defense.

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⁵ Sernylan: Bio-Ceutic Laboratories, Inc., St. Joseph, Missouri 64502, USA.

⁶ Acepromazine: Ayerst Laboratories, New York, New York 10017, USA.

⁷ Cap-Chur short-range projector, Palmer Chemical and Equipment Co., Inc., Douglasville, Georgia 30134, USA.

⁸ Designed by G.E. Folk, Jr., The University of Iowa, Iowa City, Iowa 52242, USA.

Examination two months later revealed a reducible ventral abdominal hernia with a 2 × 8 cm hernia ring. The small size of the hernia in relation to the animal, its reducibility, and the lack of trauma to the hernia sac led to a tentative decision to withhold surgical intervention.

Ten months later, during the summer, the bear was allowed to use a 1 m high concrete pool. Crawling over the edge of the pool resulted in trauma to the herniated mass and subsequent ulceration of the skin. Since additional localized trauma could be expected, surgical repair was indicated.

The animal was anesthetized as described above and the hernia repaired by overlapping the edges of the ring in a vest-over-pants fashion.

DISCUSSION

The cause of the draining abscess at the transmitter site is uncertain. The possibility of contamination at the time of surgical implantation exists. A more likely cause is sepsis and tissue reaction secondary to damaged transmitter encapsulation material. Many pieces had become dislodged from the transmitter, allowing direct contact between

transmitter and surrounding tissue. Similarly coated transmitters subsequently sutured in the abdomens of two wolverines (*Gulo gulo*) yielded similar results. Within two weeks after surgery the coatings had fractured, and entrance of body fluids caused transmitter failure. Similarly implanted transmitters have been reported to become dislodged and pass through the abdominal wall and skin to the outside.² In the present instance, the case history revealed that the animal inadvertently had been given access to a pool within a week after the surgical implantation. Dragging his ventral abdominal wall over the rim while entering the pool may have fractured the coating.

The hernia was undoubtedly secondary to dehiscence of the muscle layers. The failure of muscle healing could have been due to sepsis, type and strength of suture material, type of suture pattern, or a combination of these. The surgical technique of overlapping the edges of the hernia ring is commonly used in surgical repair of abdominal hernias in horses³ and in laparotomy closures in cattle. Despite the high tension placed on the suture material in this case, healing occurred.

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