



Umbilical Hernia in a free-ranging male Polar Bear (*Ursus maritimus*), Utqiagvik, Alaska

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Case history: Male (♂) adult polar bear, body length estimated at 7', poor body condition. Hunter noted during butchering a protruding sack or "cyst" on the belly and submitted partial carcass to NSB-DWM for further veterinary examination. For details on hernia characteristics see Table 1. Additional pathological findings included pneumonia and poor dental health.

Table 1. Summary of characteristics of umbilical hernias in polar bears.

| Animal ID | Status | Sex | Age (yr) | BM (kg) | Size (cm) | Tissue | Ring (cm) | REF |
|---------------|---------|-----|----------|---------|-----------|---------------|-----------|--------------------|
| 2017PB0424 HC | wild | ♂ | ___ | ___ | 6x6 | omentum | 3x3 | <i>This study</i> |
| PB-B-5-8-1989 | wild | ♂ | ___ | ___ | 10x10 | ___ | 2x2 | <i>This study</i> |
| XX-12-3-97 | wild | ♂ | ___ | ___ | 3x8.5 | abdominal fat | 2x2 | <i>This study</i> |
| No ID | captive | ♂ | 8 | 450 | ___ | ___ | 2x8 | Philo et al 1979 |
| No ID | captive | ♂ | 16 | 440 | 20 | omentum | ___ | Velguth et al 2009 |
| No ID# | captive | ♀ | 16 | 201 | 10 -22 | omentum | ___ | Velguth et al 2009 |
| No ID | captive | ♂ | 18 | ___ | 25 | omentum | ___ | Velguth et al 2009 |
| No ID | captive | ♂ | 16 | 470 | 25 | abdominal fat | ___ | Velguth et al 2009 |

Clinical Significance

This is the first report of umbilical hernias in wild polar bears. They are clinically inconsequential if no vital tissues are entrapped. However, in captive polar bears umbilical hernias had a tendency to enlarge over time with possible ulceration of overlying skin and were associated with declining body condition and ill thrift (failure to thrive). These data have a male-biased distribution of occurrence of umbilical hernias with 7/8 having occurred in male adult polar bears.

Acknowledgements: Current tissues were collected under USFWS Permit #MA134907-0. Many thanks to the hunter for providing the carcass and other information on the animal. Our work would not be possible without the permission from the hunters to examine their harvests, and their interest and curiosity in finding out more about their subsistence animals. Quyanaq!

Fig. A. Umbilical hernia (6 x 6 cm) . The hernia sack is opened and fat tissue protrudes.

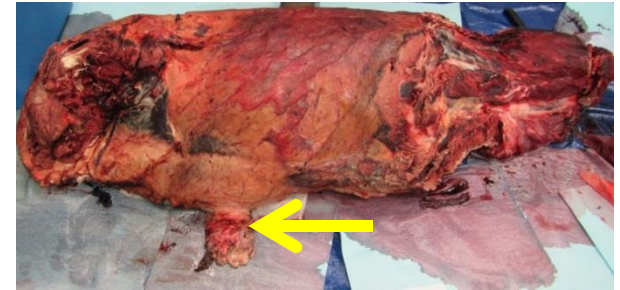


Fig. B. Entrapped omentum attached to the inner abdominal wall.



Risk Factors

Captive: poor body condition, limited exercise, ageing and enclosure design
Wild: possible congenital incomplete umbilicus closure, navel infections, excessive abdominal muscle strain during hunting and retrieving of large prey, conspecific trauma (e.g. breeding season; territory etc.)