

# Surgical Repair of Umbilical Hernia

By Dr. Bill Christenberry

We were presented a three month old female llama for surgical repair of a congenital umbilical hernia. An umbilical hernia is an opening or defect in the muscular abdominal wall. It is in the spot where the umbilical cord was attached to the baby while in utero. In most cases once the umbilical cord detaches, the defect shrinks and closes within days to weeks. In some cases, however, this closure fails and a hernia is the result. The hernia on this llama was approximately 8 cm in diameter and had previously been treated conservatively by the owner with pressure wraps with little success.

The cria was still nursing, therefore was fasted for only 8 hours prior to anesthesia and surgery. She was presented on the morning of surgery at a weight of 34 kg (75 pounds). She was preanesthetized with 13.6 mg (.4mg/kg) of xylazine and 136 mg (4mg/kg) of ketamine deep intramuscularly (see figure 1). This achieved a level of relaxation and sedation to allow intubation with a size 8 endotracheal tube (see figure 2).



Figure 1



Figure 2

The use of isoflurane inhalant anesthesia allowed a much more satisfactory, controllable, and maintainable



Figure 3a



Figure 3b

level of anesthesia throughout the procedure than could have been achieved with injectable anesthesia only (see figure 3). Once anesthetized, the cria was placed in dorsal recumbency (on her back) and the surgical area was shaved, scrubbed, and prepared for an aseptic surgery (see figure 4).



Figure 4a



Figure 4b

The surgeon then draped the area with a fenestrated (small opening or window through which to perform the

surgery) drape. A 10 cm incision over the hernia was then made with a #10 scalpel blade (see figure 5). The hernia was explored and found to have

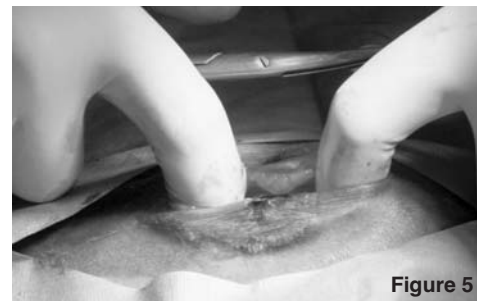


Figure 5

falciform ligament and omentum (these are both normal occurring fatty and ligamentous structures within the abdomen) adhered to the edges of the hernia. This is to be expected as the hernia is recognized as an abnormal opening by the body and the structures naturally adhere in an attempt to “heal” itself.



Figure 6

These adhesions must be broken down and cleared away for the repair to be successful (see figure 6). These structures were removed by gentle traction and sharp dissection with Metzenbaum scissors. Then the edges of the hernia itself formed by portions of the abdominal wall were cut away to remove the scar tissue that had formed there. This acts to make the wound “fresh” by causing it to hemorrhage (bleed) slightly, thereby bathing the wound edges in life-giving and healing nutrients delivered in ample quantities by the blood. Therefore, a fresh wound heals much more readily than an old, scarred wound.



Figure 7

Once the adhesions were removed and the wound edges were prepared, the actual defect was closed using size 0 Monocryl absorbable sutures spaced about 6 mm apart (see figure 7). This pattern is called a simple interrupted pattern because individual sutures are placed, tied, and cut and then another next to it in succession until the wound is closed (see figure 8). Once the hernia is repaired, thus

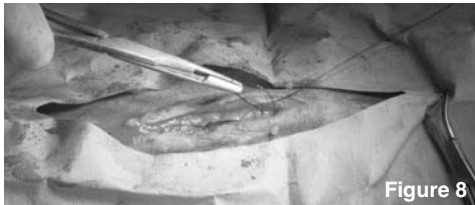


Figure 8

closing the abdominal wall, the subcutaneous tissue (just under the skin) is closed and pulled together by a continuous 2-0 Monocryl absorbable suture (see figure 9). This is called a continuous pattern because the suture is tied at one end of the wound and then woven throughout the wound and then tied again at the other end.

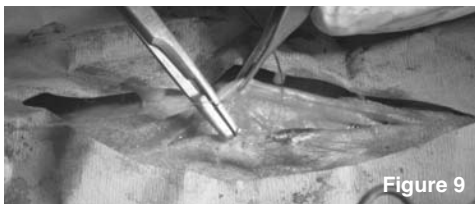


Figure 9

This served to bring the skin edges together and eliminate “dead space” where fluid pockets might form postoperatively. The skin edges at this point were closely apposed but not touching and Nexaban (a surgical tissue adhesive) was used to “glue” the skin together (see figure 10).

Once the surgery was complete, the isoflurane anesthetic gas was turned to 0, while the cria breathed pure oxygen. She was given 1.7 mg (.05 mg/kg) of butorphanol intramus-



Figure 10a

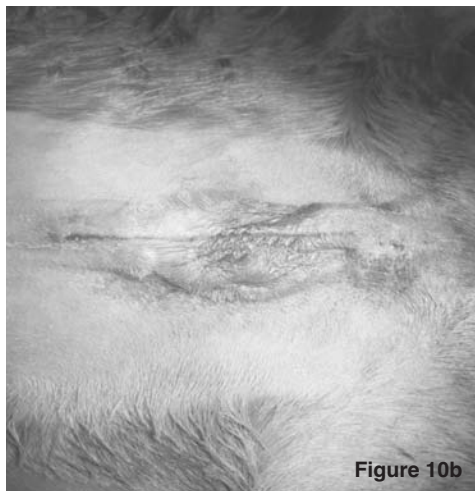


Figure 10b

cularly postoperatively for pain. Within six minutes her swallowing reflex returned, and the endotracheal tube was removed (see figure 11).

Within 30 minutes she was able to stand, at which time a belly wrap was



Figure 11



Figure 12a

placed around her abdomen for support for 3 days (see figure 12).

*Dr. Bill Christenberry is a 1986 graduate of Auburn University’s College of Veterinary Medicine. He is a general practitioner who has had a special interest in veterinary care for llamas since 1991. Dr. Christenberry, with his wife Kim, has five children, is an elder in his church and cycles 4000 miles per year.*



Figure 12b