

# **Weekend with Bernie**

By

Natalie A. McCormick  
Mississippi State University  
College of Veterinary Medicine  
Class of 2022

Advisor: Darcie Sidelinger, DVM

**Introduction:**

Inguinal hernias in bulls can be categorized as either congenital or acquired and then even further described as either direct or indirect. The most common type of inguinal hernia in the mature bull is acquired and has a non-traumatic origin. Acquired, indirect inguinal hernias are typically not considered an emergency and can be managed in time with elective surgery if the bull is being kept for breeding purposes.<sup>4,5</sup>

**History and Presentation:**

74, a four-year-old, polled Hereford bull, was presented to the Mississippi State University College of Veterinary Medicine Theriogenology service on March 11, 2021, following a three-day history of unilateral scrotal swelling. 74 did not receive medications prior to presentation.

On presentation, 74's vital parameters were within normal limits. He had a heart rate of 80 beats per minute, a respiratory rate of 48 breaths per minute, and a rectal temperature of 100.2 degrees Fahrenheit. He weighed 2,180 pounds. There were no abnormalities heard on cardiopulmonary auscultation. On further examination, it was noted that there was an hourglass shaped swelling of the left side of the scrotum. The remainder of 74's physical examination was within normal limits.

**Diagnostic Approach:**

74's condition was evaluated using physical examination and transrectal palpation. On transrectal examination, the left inguinal ring was thin and dilated when compared to the right inguinal ring. The intestines were also able to be tracked exiting through the left inguinal ring at that time.

74's scrotum was also palpated at this time. The left side of the scrotum was doughy, non-painful, and the swelling was non-reducible. Ultrasonography was used to further evaluate the unilateral scrotal swelling. Motile hyperechoic material, that resembled intestinal contents, was seen consistently on serial ultrasonographic imaging. A small amount of anechoic fluid was also noted around the testicle. The testicle on the affected side commonly undergoes degeneration due to pressure atrophy and higher temperatures caused by the herniated intestine<sup>1</sup>.

### **Pathophysiology:**

As mentioned above, inguinal hernias in mature breeding bulls can be classified as direct or indirect, acquired hernias. The classification of direct or indirect depends on whether the abdominal contents herniate through a natural body opening or through a traumatic disruption of normal anatomy<sup>2</sup>.

Direct inguinal hernias are typically a result of trauma from fighting with other bulls or becoming tangled in fences. Increased abdominal pressure causes a break down in the peritoneum near the inguinal rings and allows the intestines to herniate into the scrotum. Direct inguinal hernias have no predilection for either side of the scrotum.<sup>2,4</sup> Regardless of the origin, direct inguinal hernias almost always cause intestinal strangulation and are therefore a surgical emergency. Clinical signs associated with direct inguinal hernias include generalized scrotal swelling, signs of colic, shock, and abdominal distention<sup>2</sup>.

Indirect inguinal hernias are typically noticed by producers as a scrotum with a characteristic hourglass shape. These bulls typically present normal clinically other than a unilateral scrotal swelling.<sup>4</sup> This type of hernia typically occurs in beef bulls that are older than three years of age and is thought to be a result of over feeding and excess body fat during calf

and yearling stages<sup>5</sup>. Over-conditioned bulls typically have enlarged inguinal fat pads that are due to retroperitoneal fat protruding through the inguinal rings. This protrusion of fat can cause irreversible dilation of the inguinal rings. When the bull loses an excessive amount of body fat, the inguinal fat pads may shrink leaving the enlarged inguinal rings prone to herniation<sup>2</sup>. More than 90% of indirect inguinal hernias occur on the left side due to the weight of the rumen and the preference of mature ruminants to lie in right sternal recumbency with the left hindlimb abducted<sup>2</sup>. This allows the left inguinal ring to abnormally dilate allowing intestinal contents to exit the abdominal cavity and enter the scrotum through an intact inguinal ring. Although the physical exam is typically normal with this type of hernia, it can result in issues with normal testicular thermoregulation<sup>2</sup>.

Neither type of acquired inguinal hernia is considered heritable. The repair focuses on salvaging the bull's future as a potential breeder. Trauma, inflammation, or swelling of the scrotum or testicles can result in impaired testicular thermoregulation. Hemicastration should always be considered with unilateral testicular disease<sup>4</sup>. When one testicle becomes inflamed or swollen, the resulting heat affects the thermoregulation of the contralateral testicle and commonly results in degenerative changes.<sup>2</sup> Most bulls will return to adequate fertility after surgery if the contralateral testicle has not been severely affected. Compensatory hypertrophy of the normal testicle allows for production of up to 75% of the bull's normal sperm capacity. It is important to counsel the owner before surgical repair to ensure that they understand that the bull will likely be productive in a herd situation, but he will never pass a standard breeding soundness examination for sale or show purposes.<sup>4</sup>.

### **Treatment and Management:**

An acquired inguinal hernia was the most likely differential diagnosis for 74's unilateral scrotal swelling. Due to 74's time of presentation and stable condition, he was hospitalized and monitored over the weekend for changes in behavior and decreased intestinal motility. Surgical correction of the hernia and hemicastration were planned for Monday, March 15, 2021. He was offered half of a scoop dairy pellets twice per day, ad lib Bermuda grass and Timothy hay, and water. An ultrasound was performed on his scrotum every 24 hours until Saturday morning. At that time, it was noted that 74 had only defecated a small amount since his arrival on Thursday morning. He had also been seen kicking at his testicles overnight and appeared to be slightly uncomfortable. Ultrasound examination still revealed motile intestinal contents, so it was decided that an ultrasound would be performed every four hours until the time of surgery. This decision was made so that hopefully the bowel would not become strangulated. Intestinal strangulation, resulting in necrotic bowel, would increase the need for an intestinal resection and anastomosis. Survival rate following that surgery is very low in cattle. 74 remained stable throughout the rest of the weekend. His feed and hay were pulled at 10 am on Saturday and his water was pulled at 10 pm on Sunday in preparation for surgery Monday.

On the morning of March 15, 2021, a 14 gauge 5 ½ inch catheter was placed in 74's left jugular vein. He was administered butorphanol and xylazine intravenously for sedation. It is believed that his jugular catheter was kinked at that time. After his jugular catheter was deemed patent, additional xylazine was administered intravenously. At the time of induction, ketamine and diazepam were administered. A 24 mm endotracheal tube was placed and 74 was maintained on sevoflurane and mechanical ventilation throughout surgery. Lactated ringer solution was also provided during surgery at 2 liters per hour for a total of 3.5 liters total. Once fully anesthetized, 74 was placed in right lateral recumbency and his left hindlimb was hoisted into the air. The

inguinal region and scrotum were clipped and prepped with a chlorhexidine scrub. Surgical masks, caps, and gowns were donned, and the surgical field was sterilely draped. A line block was performed using lidocaine. A 10-inch incision was made over the inguinal region with a #22 scalpel blade. The subcutaneous and muscular layers were undermined and dissected down to the left inguinal ring. The herniated intestines were retracted from the scrotum and replaced back in the abdomen. No adhesions were located at that time. The left spermatic cord was dissected, ligated, clamped, and excised with the use of an emasculator. The inguinal ring was closed with #4 Braunamid in an interrupted, cruciate pattern. A 5-inch vertical incision was made into the left side of the scrotum with a #22 scalpel. The testicle was exteriorized and retracted out through the incision. The scrotal incision was connected to the inguinal area for better dead space closure. The subcutaneous layer was closed using #3 chromic catgut in a simple continuous pattern. The skin was apposed with #3 Braunamid in a ford interlocking pattern. The scrotum was wrapped in Elastikon and anesthesia was discontinued. A caudal epidural was administered using morphine for pain control, and recovery was uneventful. 74 was offered Bermuda grass and timothy hay soaked in water and his respiratory rate was checked periodically overnight. Procaine penicillin G was administered subcutaneously every 24 hours for 5 days. Meloxicam was also administered orally every 24 hours for 3 days following surgery. On Tuesday, March 16<sup>th</sup>, due to lack of defecation, manual evacuation of the rectum and distal colon was performed. His feces was dry and firm but became more soft proximally. A salt block was added to his stall, and he continued to eat and drink throughout the day. 74 began defecating normally overnight and his fecal consistency was normal. His scrotum was swollen and firm on palpation but remained bandaged while hospitalized.

On March 19<sup>th</sup>, 74 was four days post operation and was doing well in hospital. He was eating, drinking, and consistently defecating normal fecal piles. He was discharged that afternoon with instructions to be sexually rested and re-evaluated in 60 days.

**Case Outcome:**

On March 28<sup>th</sup>, 74 returned to the MSU-CVM Theriogenology service for a recheck following a 3-day period of swelling around the preputial orifice and lack of urination. On presentation, 74 was bright, alert, and responsive. On transrectal palpation, the ligated spermatic cord could be appreciated in left inguinal region and the inguinal ring on the left could not be appreciated. This indicated that surgical closure of the inguinal ring was successful. The urinary bladder was not significantly distended with urine. Attempts to manually stimulate urination were unsuccessful. Salix, a diuretic, was administered in the tail vein to cause 74 to urinate. 74 was monitored and was noted to urinate an adequate amount with a good stream. It was determined that he could indeed urinate. The swelling around the preputial orifice was also examined and had decreased in size from the previous pictures but was still present. The swelling was likely the result of migration of edema from the original surgery and would likely resolve over time. Sutures were removed from the previous surgical incision, and the site appeared to be healing appropriately.

After a 60-day period of sexual rest, a breeding soundness exam was performed by 74's family veterinarian to evaluate semen quality. At that time, 74's semen evaluation was inadequate. He was taken home and rested for another 60 days. When rechecked, 74's semen was deemed acceptable for breeding. 74 was turned out with a small group of cows and is doing well at this time.

## References:

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