

# Rectal Prolapse in a Greater Indian Rhino (*Rhinoceros unicornis*) at the Toronto Zoo

By

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The Toronto Zoo currently houses 1.1 Indian rhinoceroses - Patrick, a 31-year-old male, and Indira, a 30-year-old female. Keepers working with these animals have established a trusting relationship with them as a result of close daily positive interactions. This relationship played a major role in the successful outcome of a potentially life-threatening situation when the male, Patrick, had to undergo two surgeries for a rectal prolapse in February 2002.

Part of the daily husbandry routine with these rhinos involves tactile interactions such as brushing, rubbing, and showering. Brushing begins with keepers standing outside of the pen and continues until the rhino is calmly lying down. At this point two keepers will enter the pen. While one continues to brush and watch for signs that the rhino may get up, the other checks the rhino's feet and other areas for potential problems. At this time any topical medications can be applied if necessary. Behind-the-scenes tours of the rhino house have also helped to introduce the animals to a variety of people making them comfortable with anyone who enters their area.



Patrick's prolapse. (Photo by Des Maguire)

the exposed tissue was quite swollen and fresh blood was present. The vet once again replaced the tissue, but by noon Patrick had re-prolapsed. After discussions between the veterinary and keeping staff, it was decided he required immediate surgery. Prior to receiving the anesthetic, keepers began

In 1989 the Toronto Zoo acquired Patrick, a 15-year-old male Indian rhino, on breeding loan from the Bronx Zoo in New York. Despite being in good physical condition, Patrick suffered from recurring rectal prolapses at both zoos. This condition occurs when the lower end of the rectum turns itself inside out and protrudes from the anus. Rectal prolapse is often associated with extended periods of constipation and excessive straining. In 1976, Patrick's mother underwent extensive surgery for a rectal prolapse at the National Zoo in Washington D.C. Based on his family history, Patrick may have a hereditary predisposition to this condition. Patrick most often prolapsed when he was relaxed and lying down and normally the swollen tissue protruding from the rectum would recede upon standing and no medical treatment was required.

On the morning of 8 February 2002, the keeping staff observed that the prolapsed tissue did not withdraw on its own so the veterinarian was called. After examination and with keeper assistance, the tissue was guided back into the rectum by hand. The next morning the prolapse had recurred.

Patrick appeared to be uncomfortable as



Patrick's Surgery on 9 February 2002

brushing Patrick in order to relax him and allow the vet to administer the sedative directly into the hind leg. To ensure he remained calm, two keepers entered his pen and continued brushing and stroking him until he was lying down, approximately 20 minutes later. Anticipating a lengthy surgery, he was maintained at a light level of sedation. During the three-hour surgery, the vets removed approximately one kilogram (2.2 lbs.) of vascularized tissue and performed a resection of the rectal wall. Patrick was standing calmly within 10 minutes of receiving the reversal drug.

On 10 February, 24 hours after the surgery, Patrick was sluggish but appeared to be in good spirits. In order to decrease the rhino's gastrointestinal activity, roughage (hay) was

removed from his diet and his food intake reduced. A mixture consisting of oral antibiotics, fiber cubes, alfalfa cubes, apples and carrots, and one litre of mineral oil, was offered four times that day. During the day, a small amount of feces was passed without the presence of blood or further prolapse. Upon palpation, the incision felt secure and the prognosis looked good. Unfortunately, during morning rounds the next day, Patrick was found to have prolapsed again, most likely while defecating. The floor of his pen was covered with blood and there was a small amount of feces. It was estimated he lost between 7 and 10 liters (14-21 pints) of blood during the night most likely from pressing up against a wall causing the prolapse to rupture. Patrick was once again immobilized and the torn tissue was cleansed and re-sutured. This time Patrick took a couple of hours to recover from the anesthetic and several hours later he passed approximately one litre of blood while defecating. Patrick was bright, alert and responsive the next morning. There were no signs of a prolapse but a few large blood clots were passed throughout the day. The medicated diet was offered once that day with the addition of an iron supplement due to Patrick's significant blood loss. Small amounts of blood and large quantities of feces were passed overnight, and once again rectal mucosa had prolapsed. The tissue was easily replaced, however it became apparent that a different portion of the rectal wall was involved.

At this time the keepers were informed that Patrick's condition would deteriorate if the tissue were to prolapse and remain exposed for an extended period of time. This would result in increased susceptibility to infection, and any prolapsed tissue could further dilate and become engorged with fluid preventing it from being safely re-inserted. Patrick might also cause additional injury by rubbing the irritated tissue against the wall of his pen while defecating. The decision was made to provide Patrick with 24-hour keeper care. His feedings were decreased from four to two times daily to further decrease gut motility, and mineral oil was increased to two litres. Apples were removed from the diet for fear that they might cause flatulence. Overnight on 13 February, Patrick prolapsed every hour, always while lying down. The keepers on duty allowed him to remain sleeping, but monitored the tissue for swelling. When the prolapsed mucosa became enlarged, Patrick would be made to stand so that the tissue could be gently directed back into the rectum. To do this the keepers on duty

would begin scrubbing him with a long handled brush then move closer and rub with their hands. While one keeper continued to do this, the other would re-insert the prolapse which always went in easily. Patrick showed no aggression during any of these interactions and always seemed to 'know' his keepers were a source of relief for him. Throughout the day of 14 February, Patrick prolapsed three times while defecating. Keepers monitored the prolapse for swelling but luckily the tissue receded on its own without assistance each time. Due to the mild weather, Patrick was given access to the paddock where he was allowed to exercise for three hours. Through the night he defecated five times and prolapsed only once and required no keeper assistance. During the next 24-hour period he prolapsed on four occasions and only once was keeper assistance necessary to guide the tissue back into the rectum.

During the next 48 hours, Patrick did not prolapse. Through rectal palpation, the sutured tissue appeared to be less swollen and seemed to be healing well. On 18 February, one week since the last surgery, the veterinarian increased his rations to normal amounts and frequency and decreased the amount of mineral oil being added. Four days later timothy hay was slowly reintroduced and the antibiotic treatment ceased. Patrick had not prolapsed in 14 days, and by 2 March he appeared in excellent health and was consuming his regular diet.

Many factors contributed to the successful resolution of this serious medical condition. These include the skill and experience of Toronto Zoo's veterinarians and the open and effective communication between veterinary and keeping staff. Without the dedication, commitment and professionalism of the keeping staff, seen in their willingness to provide the necessary 24-hour care that Patrick required, his health might not have improved as quickly. It is also important to note that the daily interactions between the keeping staff and the Indian rhinoceroses, which at times may have seemed routine, played a critical role in Patrick's treatment and recovery. It acclimated the rhinos to a wide variety of situations so that handling during a crisis such as this, was better tolerated by both the rhino and the keepers. These factors, as well as Patrick's good nature, ensured a successful outcome to this case.

**Update:** Patrick has now been 'prolapse-free' for 3 1/2 years.



A recent photo of Patrick shows a healthy animal no longer troubled by rectal prolapse.

*(Photo by Karyn Tunwell)*