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The Saga of Jasai

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Gladys Porter Zoo, along with Texas A & M College of Veterinary Medicine, recently made history by being the first institutions to attempt "colic surgery" in a rhinoceros. And even though the animal was eventually euthanized, great strides were made in regards to future treatment options for these impressive beasts.

Jasai, a five year-old Asian rhino (*Rhinoceros unicornis)* was housed "behind the scenes" after his arrival earlier this year, while his outside exhibit was being renovated. He was little trouble except that he turned into a "teenager", charging around the barn and skidding into rails, thereby forcing us to place the barn off limits to everyone except his keepers. Outside of his quarantine exam and normal preventive medicine procedures, he required little attention from the Animal Health Department. That medical anonymity came to an abrupt halt. An animal as large as Jasai produces a lot of feces overnight and it was obvious and alarming to see one morning that Jasai had produced very little. Nor had he eaten or drank his normal amount of food and water.

In zoological medicine we deal with an enormous number of species of animals, many we know very little about. Often we extrapolate from the closest species we do know something about. In the case of rhinoceros, that species is a horse. Anatomically and physiologically, a rhino is most like a horse. Any of you who are horse owners are aware of a condition called colic. Equine colic is an abnormal state of the horse's digestive system. For some reason the gut just quits moving. At one time or another, just about everything has been thought to cause colic. Usually it is due to some type of dietary insult; often the cause is undetermined. Except in its mildest form, equine colic is a serious condition and left untreated, is generally fatal. Even with treatment, there is a high mortality rate, especially for those horses which require surgery.

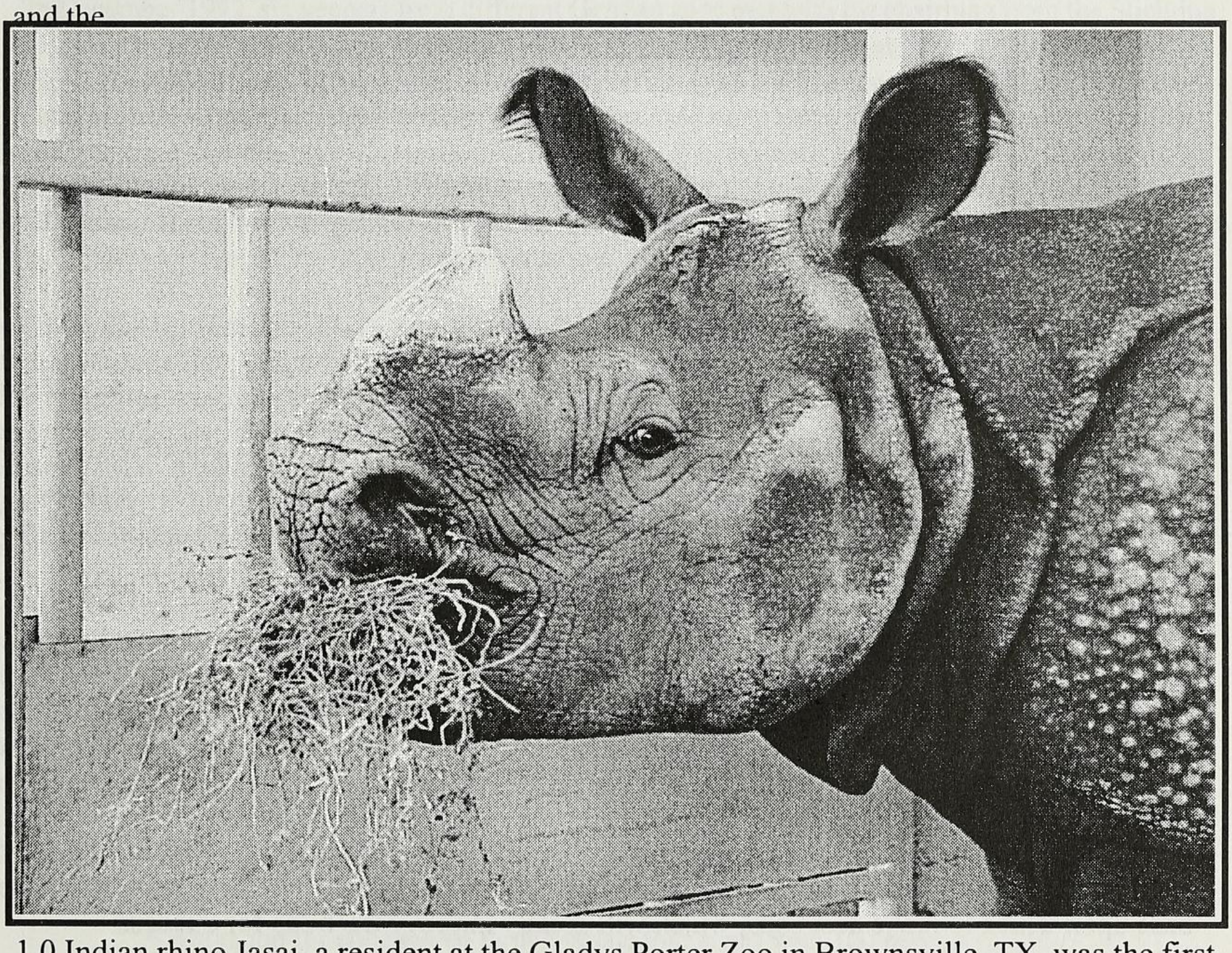
Treatment usually centers around massive fluid therapy using intravenous catheters, emptying the stomach with a stomach tube, often subsequently instilling a lubricant such as mineral oil, giving a rectal enema in an attempt to loosen any proximate fecal material, and the administration of various drugs to relieve pain, promote intestinal movement, and prevent ulcers. If medical therapy does not resolve the problem, or tests indicate that the gut has been compromised, surgery is attempted. During surgery, the affected portion of the gut is located and corrected or removed, the remaining intestines are emptied of their contents, which by now have become dried and compacted, the abdominal cavity is rinsed out, and the animal is sewn up. Unfortunately, horses are somewhat delicate, especially when it comes to their stomach and abdomen, and many fail to survive.

On the morning of 4 October 2000, the general curator reported that Jasai did not pass any feces and was off his feed. Over the next several days diagnostic tests were performed and a diagnosis of colic was made; we were unable to determine any underlying cause. Jasai was treated with the help of the local equine veterinarian as you would any horse, with several inordinate exceptions. First of all, most horses are handleable. Even in a specially designed rhino chute, Jasai required sedation with powerful drugs just to be touched, even more to allow passage of stomach and rectal tubes. Second, the average horse weighs 1000 lbs. (454 kg). Jasai weighed close to 4,000 lbs. (1814 kg) The quantity of drugs needed to be administered taxed all of our supplies, including all the local pharmacies. Lastly, horses have a thin coat of hair and easily accessible veins; Asian rhinos are covered by large, thick plates and have only tiny veins in their ears and lower legs. Even though Jasai was cooperative, as sick rhinos go, he was still a difficult patient.

Jasai's colic failed to resolve with medical therapy and a decision was made to transport him to

Texas A&M University of Veterinary Medicine for probably surgery. As with the rhino chute, there are specially designed crates and trailers to move extremely large and powerful animals and one such animal transporters answered our emergency call, driving night and day in order to move Jasai in the shortest amount of time. Once at the veterinary school, additional diagnostic tests and medical therapy ensued. The tests continued to indicate an intestinal impaction. It quickly became obvious that it was impractical to continue to try to treat Jasai medically. This was both from a logistical point of view, in the amount of fluid he required – which we were frustrated in our attempts to supply – and the fact that all work on Jasai required sedation which further compromised the function of his intestines.

It was decided to take Jasai to surgery. It was a "live or die" kind of decision; it would force some kind of resolution. But could we take a rhino to surgery? Several rhinos, mostly Asian and Sumatran rhinos, have been afflicted with colic. But they have either been very mild cases, or so severe that the animals died before any intervention could be attempted. There had been only one other abdominal surgery attempted on a rhino and that was for an oviariohysterectomy (a spay) due to a tumor. That animal died shortly thereafter due to a complication of the spay operation, but the anesthesia and abdominal procedures were considered a success. But could we take Jasai to surgery? Once again the logistics of the situation were daunting: handling a wild and dangerous animal in an academic and hospital setting; moving a two-ton sleeping animal; the sheer quantity of fecal material that would have to be removed from the intestines; and the



1.0 Indian rhino Jasai, a resident at the Gladys Porter Zoo in Brownsville, TX was the first rhino to undergo "colic surgery". *(Photo by Elizabeth Garcia)*

length of time that he would have to be under anesthesia. All indicated a very poor prognosis, but we felt it was Jasai's only option.

On 11 October 2000, with the help of a monstrous forklift, Jasai's transport crate was snuggled

up against a padded equine stall where he was sedated and allowed to go to sleep. Two three-ton hoists were attached to his legs and he was moved into the surgery suite where he was intubated, monitored, prepped, and draped just like a human surgical patient. The room was awash with people, each performing their specific task on the rhino's behalf. Jasai's abdomen was opened and his intestines cut into and emptied. It was hot and hard work and took hours; the surgeons traded off, almost "falling into" their patient his body was so deep. There was no obvious cause for Jasai's colic, just yards and yards of dry fecal material. Once again we had trouble providing enough fluids to Jasai due to the size and nature of his veins. The anesthesiologist worked diligently, adjusting anesthetics and heart medications as needed. After nine long hours, the surgery was finished and the hoists were again used to move Jasai back into the recovery stall. All of us who have witnessed long procedures on large, wild animals knew he would never stand up; it was just too much. But after disconnecting all the anesthesia equipment and administering a reversal agent, Jasai stood up almost immediately! He was still groggy and tired and laid down again after a few minutes, but he had stood!

Almost as much of a surprise, Jasai was still alive the next morning. He even ate and drank a small amount and there was much elation, congratulations, and good expectations. But he did not continue to progress, and we once again faced the same obstacles in his care that we had before the surgery. It was decided to transport Jasai back to the Gladys Porter Zoo where he could be offered more extensive treatment with the use of the rhino chute.

Upon returning home, Jasai once again ate and drank a small amount but refused more; his weight loss had become noticeable. Over the next week we continued to work with Jasai, luckily without the use of sedatives. We were able to determine that at least a portion of his intestines would respond to prokinetic medications and begin to contract, but he did not pass any fecal material. Unfortunately, his attitude rapidly deteriorated on 17 October. Blood work indicated that his kidneys were failing and we suspected that he had a bleeding ulcer in his stomach. The decision was made to euthanize Jasai.

When an animal dies at a zoo, the veterinarian performs a necropsy, the animal equivalent of an autopsy. Like everything else involving Jasai, his necropsy required many staff members and many hours. The necropsy showed that all of his incisions all healed normally; the surgery had been "successful". Unfortunately, his kidneys had failed and he had a large, bleeding ulcer in his stomach. Lastly, it appeared Jasai's digestive tract never began functioning again. His stomach was full of food and water but it did not move down into his intestines; yet again, no underlying cause could be found. Jasai's tissues have been sent off to a pathologist in the hope of learning something more. Jasai's remains have been buried on the zoo grounds.

I have been at the Gladys Porter Zoo for over a decade now. And while this same effort has been put into other animals requiring extensive surgeries or medical specialists, I cannot recall a case that has required as many resources as Jasai's. We should be proud of our efforts and of the facts that, despite the zoo's limitation of size and location, we were able to provide Jasai the very best that veterinary medicine has to offer, as well as having advanced the frontiers of care of large megavertebrates. Jasai's saga has already been discussed among rhino holding institutions. Scientific papers will be published to disseminate specific information covering a broad range of topics. And the next time a rhinoceros requires major surgery, there will be a greater knowledge base upon which to make decisions, which will greatly improve the odds for success.

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