BRIEF COMMUNICATIONS

Giraffe Squeeze Cage Procedure

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A squeeze cage at Woodland Park Zoo has become a valuable tool in giraffe management. The cage has been used 63 times in 4 years with no serious injuries to animals or personnel. Conditioning the giraffes to the cage is of foremost importance in planning a successful restraining procedure. Individual giraffes react differently to the stress of being confined, so careful monitoring of behavior throughout is imperative to anticipate and prevent potential problems. Staff should be fully trained in the use of the equipment and familiar with the temperament of the giraffe. The cage is used for hoof trimming and routine medical examinations, including blood collection, X-rays, and giving injections.

Key words: giraffe, squeeze cage procedure, restraint, hoof trimming, conditioning, zoo management

INTRODUCTION

"Of all the ungulates, the giraffe has the poorest history of successful immobilization" [Fowler, 1978]. Although improved methods of chemical restraint have been developed, there is always an element of risk that a giraffe may injure itself or personnel during the induction and recovery process. A variety of chutes have been developed to restrain giraffes physically as an alternative to chemical restraint for minor medical procedures. A squeeze cage has been successfully used at Woodland Park Zoo for hoof trimming and medical procedures. The cage was designed to allow accessibility and visibility of the animal and at the same time protect personnel; to restrain giraffes of various sizes; and to be opened quickly to release the animal if there is a problem. Between January 1981 and January 1985, the cage was used 63 times. Although the majority of the procedures (40) have been on one giraffe, the cage has been used on four different animals. Three of the 63 procedures were not completed because of equipment failures or unforeseen problems with the giraffe. There have been no major injuries to animals or personnel from the use of the cage. A program of conditioning the giraffe to the cage has proved invaluable in reducing stress during the procedure.

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EXHIBIT DESIGN

A naturalistic African savanna exhibit was opened at the Woodland Park Zoo in June 1980. One of the features of the new Giraffe House is a built-in giraffe squeeze cage designed by Jones and Jones, zoo veterinarian James W. Foster, and members of the keeper staff.

The Giraffe House is a steel prefabricated building divided into a service area and a holding area. There is one large room in the holding area. The holding area has seven interconnecting pens and a small room that may be opened into the large room, or closed to isolate a sick giraffe or a new animal. This isolation room contains the squeeze cage and has access to an outside corral.

The giraffes are moved to and from the savanna exhibit via a series of gates. As the animals go outside, and as part of their routine, they are routed through the room containing the squeeze cage in its stored position. On days the giraffes are kept in the barn because of excessive cold or wet weather, they are given access to an outside corral via the isolation room. The keepers try to maximize the time the giraffes spend in the isolation room so the animals will become accustomed to the squeeze cage.

EQUIPMENT

The squeeze cage is made of double-strength steel. The horizontal supports are 6.4-cm-diameter pipe. The vertical corner supports are 6.4 cm square. Side 1 of the cage has no wheels and is attached permanently to the floor and wall (Fig. 1). The other three sides have wheels that enable the cage to be used in three different configurations (Fig. 1).

The first position is the storage position. When the cage is not in use, it is left open, with the three movable sides anchored in a straight line perpendicular to the fixed side. In this storage position the squeeze cage takes up a minimum of space in the isolation room.

The second position forms a rectangular box. This position is achieved by keepers maneuvering two of the mobile sides of the cage around the giraffe, encircling the animal, and closing the cage door. A heavy-duty hook, anchored to the wall, is attached to side 2 to stabilize the cage during the capture phase. A metal pipe brace is attached to side 3 to prevent the giraffe from pushing the cage back on the keeper, and a horizontal metal pipe 3 m from the floor acts as a backup to the brace, limiting the maximum open position of side 3. The horizontal pipe is removed and stored when the cage is not in use.

The third position forms a parallelogram. Once the giraffe has been encircled and the cage is in the rectangular box position, the hook is removed and a winch is attached to side 4. The sides of the cage are slowly winched into a parallelogram, tightening against the sides of the giraffe and limiting the animal's movement.

The cage is designed to give easy access to the giraffe's legs. The bottom 1.5 m of the cage is open on both sides of the animal. To protect keepers from being kicked by the giraffes, there are six rows of nylon straps strung across the open areas. The straps are attached to the cage by quick-release, heavy-duty snaps. To give access to a leg, the straps in that area are removed. The two ends of the cage have plywood at the bottom to protect the keepers while they close the cage around the giraffe.

A platform or catwalk, 1 × 4 m, is positioned above the fixed side of the cage (side 1) approximately 2.6 m above the floor. The platform can be reached by two
ladders. A keeper is positioned on the platform to assist with equipment during the capture phase and to feed treats (bread, lettuce, grain) and monitor the giraffe throughout the procedure. The platform can also be used to give access to the neck and head of the giraffe for medical procedures. There is an area below the catwalk by side 2 of the cage which forms a blind spot where the animal is unable to see personnel and equipment. This blind spot has proved useful in screening potentially frightening objects, such as portable X-ray equipment.

Additional equipment is used to restrain the giraffe while it is in the cage and to protect the keepers and staff working nearby. A heavy-duty, 3.5-cm rope is secured over the shoulder of the animal to prevent it from rearing up and going over backward in the cage. A chest rope may be used to keep the giraffe from leaning against side 2 of the cage, making access to the front of the forelegs difficult. Initially, belly bands were used to prevent a giraffe from going down in the cage, but the bands were difficult to remove when a giraffe was fully reclining on them. Unless the animal is drugged or injured, it usually does not have any difficulty getting up, should it sit or lie down in the cage. A specially designed giraffe hood and halter may be used to
help control the animal’s head; however, most of the time the giraffes are calmer when they are able to watch the procedure. Other ropes are used as needed.

RESTRAINT PROCEDURE

Squeeze cage procedures are rehearsed. Video equipment may be used to monitor or record the procedure. Originally xylazine (Rompun; Cutter Laboratories, Shawnee, KS) was used to mildly sedate the giraffe before it was captured in the cage. The sedated animals sometimes became confused and overreacted to the stress of capture and confinement. The degree of sedation was difficult to gauge from procedure to procedure, and it sometimes varied from giraffe to giraffe. Conditioning the animals to the cage became a preferred alternative to sedation. The giraffes appeared calmer and behaved more predictably when they were not sedated.

It may be difficult to persuade the giraffe to enter the room with the squeeze cage. The animal is aware of the cage and its equipment, plus the personnel involved in the procedure. Initially, treats are used to entice the giraffe into the room. Removing personnel from the squeeze room may encourage the animal to enter. Force (squirt bottles filled with water, long plastic poles, etc) may be used, but every effort should be taken to avoid upsetting the giraffe whenever possible. Once the giraffe enters the room, a door is closed behind it. The cage is in a ready-for-capture position, in a C shape, held in position by a keeper and the brace. The giraffe is between the cage and the door (Figs. 2, 3).

Several keepers maneuver the cage around the giraffe, waiting until it is facing the preferred end of the cage before closing and latching the door. After the cage is locked in the rectangular position, the shoulder rope is lowered over the back of the animal by the keeper on the platform and is loosely secured by keepers at the front of the cage. A giraffe may avoid entering the cage by standing next to the door. When this occurs, the shoulder rope is tossed by the keeper on the platform over the animal’s shoulder. The slack is taken up and the rope is anchored near the front of the cage (side 2). Tension is maintained on the rope, and pressure on the giraffe’s shoulder encourages the animal to enter the cage. The chest rope is tightened before the cage is winched into the squeeze position. A butt rope may be used to restrict any forward or backward movement if desired, but for most procedures a chest and shoulder rope is adequate.

The cage is winched into the squeeze position and tightened until the sides of the cage are flush with the animal’s shoulders and hips. The slack in the shoulder and butt rope is taken in. If a hood or halter is to be used, it is put on after the giraffe has been secured (Fig. 4).

While the giraffe is in the cage it is fed treats, reassured, and kept as calm as possible. Loud noises and movement in the nearby area are kept to a minimum. Giraffes may react to the stress of being confined in different ways [Fowler, 1977]. A natural response to being in the cage may be kicking or rearing. Another response is a trancelike state, which has been observed during hoof-trimming procedures. The giraffe’s eyes appear dull, and it becomes unresponsive to external stimuli. The trancelike condition is rapid in onset and also rapid in departure. It may last up to 5 min. The animal may also tremble while in the cage, but trembling does not occur at the same time as the trance. Conditioning the giraffe to the cage is the best way to reduce complications due to stress.
Squeeze Cage Procedure

Fig. 2. View of cage in “ready-for-capture position.”

Fig. 3. Keepers are positioned at the cage door and ready for capture procedure.

Fig. 4. Giraffe restrained in squeeze position.

At the end of the procedure, the cage is returned to the rectangular position, and the shoulder rope is removed. The giraffe is allowed to stand in the cage for several minutes and is fed treats for positive reinforcement. The cage is then unlocked and opened to the capture position. The giraffe is held in the squeeze cage room for several minutes before being released into the adjacent room.
HOOF-TRIMMING PROCEDURE

Giraffes may find it difficult to support their weight on three legs for extended lengths of time during hoof trimming. It is important, therefore, to confine the animal tight enough in the squeeze cage to allow it to use the sides of the cage for support. The shoulder rope is loosened to give slack when a front leg is going to be trimmed. This allows the giraffe to lean against the rope as it shifts more weight to its back legs. If a butt rope is used, the animal may shift even more of its weight to its rear quarters, sometimes sitting on the rope instead of standing. If a giraffe has shown a tendency to sit on the butt rope, it may be desirable to try the procedure without the rope. The animal needs to be able to use aids for support but still stand solidly without relying on any single aid for the majority of its support.

Trimming procedures have been developed for both the front and back legs of the giraffe. To trim a front leg, two ropes are attached to the leg to be trimmed. A 2.5-cm-diameter cotton rope is tied below the fetlock and pulled upward and backward. To encourage the giraffe to lift its leg, a second rope is placed around the back of the knee (carpus) and pulled forward. By pulling on both ropes at the same time, the knee will bend and the leg will be lifted. The hoof to be trimmed is held in place by the fetlock rope, which is secured to the cage and held by keepers. The rope is not tied, because it is important to let the leg down quickly should a problem arise. It is advisable to let down the tied-up leg for a few minutes every 10 min. The leg should also be released if the giraffe starts to sag in the cage or shows other signs of discomfort or distress.

Although the procedure for trimming front legs has been used frequently, the procedure for trimming back legs is still in the developmental stage. Ropes are positioned the same as for lifting a front leg. The fetlock rope is pulled forward and upward at the same time a rope around the hock is pulled from behind. The hoof can be trimmed from this position, but it is very awkward for the farrier. The leg to be trimmed is pulled out, away from the cage as much as possible without causing discomfort to the giraffe. Standard farrier tools are used to trim the hoof.

ADDITIONAL USES

The squeeze cage is a valuable tool for medical procedures. Once a giraffe has been conditioned to the cage, it can be restrained for routine medical examinations, giving injections, and having blood samples taken. Potential uses for the cage in treating giraffe illnesses and injuries have only just begun to be explored. The cage has been used to treat a giraffe with a uterine infection, to flush abscesses, and to treat chronic knee sores. It has also been used to restrain animals for X-rays to determine the cause of lameness. More data need to be collected on the uses and limitations of the cage in medical procedures.

DISCUSSION

Modifications to the cage have been an ongoing process. Potentially dangerous incidents occurred during the first year of use, when the staff was becoming familiar with the equipment and procedure. Initially the shoulder rope was not put in place until after the cage was in the squeeze (third) position. A giraffe went over backward
in the cage before the rope was in place, but the animal was not injured. The procedure has been modified to ensure that the shoulder rope is secured as soon as the cage is closed.

A second incident occurred when a giraffe sank onto belly bands, at the same time shifting his weight backward in the cage. The weight of the giraffe on the belly bands made it difficult to remove the bands. Once the belly bands were released, the giraffe lay down in the cage and was able to get up on his own. Belly bands are not used in the present procedure. Equipment modifications continue to be made to make the cage safer and more effective. The number of giraffe squeeze cage procedures (54) in the past 2 years has greatly aided in the development of a successful squeeze cage procedure at Woodland Park Zoo.

It is generally agreed that a chute with restraint capabilities is most effective when it is part of the daily travel path of the giraffe. The in-path chute must be regarded as a simpler system for giraffe management. However, the Woodland Park apparatus appears to be a workable alternative to such a system.

CONCLUSIONS

1. In terms of safety, efficiency, and diversity, using the squeeze cage as a tool for giraffe management is highly effective.
2. Conditioning the animals to the squeeze cage is of foremost importance in planning a successful restraining procedure.
3. Personnel should be well trained and skilled in the implementation of squeeze equipment procedures, and all staff should be familiar with the variable spectrum of giraffe behavioral responses to restraining.
4. More data and feedback from other institutions regarding their giraffe restraint procedures will be vital in determining the ultimate potential for the squeeze cage as a management tool.

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REFERENCES
