Cougar Attacks on Children: Injury Patterns and Treatment

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**Purpose:** Cougar attacks on humans appear to be on the rise. A review of all attacks on children was performed to determine the method of attack and injury patterns so that a treatment regimen as well as possible preventative measures could be determined.

**Methods:** A review of all attacks, including attacks on children, was performed, including three recent attacks treated at our institution. Situation, adult supervision, patient age, injuries recorded, survival, and mode of attack, if known, were reviewed.

**Results:** There were 50 documented attacks on children with a 25% fatality rate. Most children were not alone at the time of the attack (92%), and in many instances adult supervision was present or nearby. Severe head and neck lacerations along with puncture wounds were the most common injury.

**Examples of typical cervical injuries include a nonfatal vertebral artery injury, phrenic nerve injury, a fatal internal carotid artery injury, and a fatal cervical spine injury. The cougar was rabid in two cases. Pasteurella resulted in late infections in two patients.**

**Conclusions:** Based on the pattern of injuries, the authors recommend aggressive evaluation for occult cervical injuries as well as surgical debridement. Antibiotics should cover oropharyngeal flora including *Pasteurella multocida*. Rabies prophylaxis is indicated. Adult supervision in wilderness areas is not necessarily protective.


INDEX WORDS: Cougar, mountain lion, trauma, *Pasteurella*, rabies.

**THE COUGAR** (*Felis concolor,* puma, mountain lion, Florida panther) is a feared predator whose natural habitat ranges from British Columbia to South America and east to the Florida Everglades (Fig 1). In the past century, its range has been diminished by deforestation and increasing urban growth.1 Additionally, more people are venturing into the cougar’s dwindling habitat and dwelling in closer proximity to cougar ranges.1 As a result of the decreasing food supply and shrinking range, humans have stumbled on to the second rung of the food chain. Over the past several decades, cougar attacks on humans have been slowly increasing, with more attacks occurring during the past 22 years than in the last century.1,2 There has been little written about the treatment of patients, either adults or children, who have survived cougar attacks.

Although cougar attacks on humans fortunately are a rare form of trauma, our institution managed several cases over the past 2 years and was consulted on another. We present two of these cases as well as a review of pediatric cases reported in the past 106 years (through July, 1997). Case reports were garnered from the available literature1,3,4 as well as from data collected by the British Columbia Ministry of Environment, Lands and Parks (Mr Atkinson).

**CASE REPORTS**

**Case 1**

A 9-year-old boy was the last in line in a game of follow the leader with seven other children playing in the backyard of a cabin in the interior of British Columbia. Several adults were in the front of the cabin. As the children rounded the side of the house, the boy was attacked by an adolescent male cougar. The cougar grasped the boy around the neck with its mouth and the cougar began to carry the child into the surrounding forest. The other children cried for help and the boy’s father rescued him by beating the cougar’s head with his fists. The boy suffered multiple bite wounds to the neck in zones I, II, and III with the lateral spinous process of C3. A preoperative four-vessel cerebral arteriogram demonstrated occlusion of the right vertebral artery at C3 without extravasation (Fig 2). He was treated with neck exploration, wound lavage with debridement, intravenous antibiotics, and rabies prophylaxis while the rabies status of the cougar was being determined. He required prolonged (2 weeks) ventilation because of right hemidiaphragm paralysis (presumed to be secondary to a right phrenic nerve neuropathy), which resolved spontaneously. He has since done well with no residual physical deficits.

**Case 2**

A 5-year-old boy was horseback riding in the interior of British Columbia with his mother and two siblings. He was knocked off his
horse by an attacking adolescent cougar. His mother rescued the child by attacking the cougar with a stick. The older siblings carried the child away while the mother continued to fend off the cougar. Before help could arrive, the mother had been killed by the cougar.

The boy suffered extensive lacerations and bites to the scalp and nose but was otherwise unharmed. His lacerations were closed over latex drains and he was treated initially with intravenous cefazolin and later oral cephalexin. One week later fever, malaise and lethargy developed. He was found to have abscess formation at the bite marks requiring incision and drainage. Cultures at that time grew Pasteurella multocida sensitive to amoxicillin-clavulanate. After treatment with amoxicillin-clavulanate he has since done well.

Review of Cases

There have been 83 documented cougar attacks in the last century. Of these, 50 have been on children (ages 0 to 18 years) with 13 fatalities. Fifty-nine percent of all attacks and 70% of all fatal attacks were on children. The average age of children attacked was 8 years. In children, attacks on boys were more common (4:1). Ninety-two percent of the children attacked were not alone at the time of the attack with many having adult supervision nearby. All but one of the fatalities in children occurred when they were alone or with other children, and 78% of attacks on children occurred when they were out of sight of an adult. All attacks occurred in either wilderness areas or in small towns near wilderness areas. Where details of the attack are documented, the victims were either isolated from a group, or last in a line of people. Seventy percent of attacks have occurred in British Columbia, with Colorado, California and the Big Bend region of Texas being the next most common problem areas. The predominant area of injury in survivors is the head and neck, followed by extremity injuries. Fatal carotid artery injuries and fatal cervical spine injuries have been reported. Rabies has been detected in animals involved in several attacks. There has been one adult and one pediatric case of death presumed to be secondary to rabies (reported in 1909). Additionally, in a recent attack, the cougar was found to be rabid.

DISCUSSION

The cougar long has been admired and feared by humans. Its usual food source includes deer, elk, and small animals. It typically stalks or lies in wait to attack a lone or isolated animal in a group. It usually attacks the victim's neck from behind so that its large teeth and strong jaws can kill its prey by suffocation, cervical injuries, or hemorrhage. There is evidence to support the premise that these attacks on humans may not be "accidental," because in some reports the same cougar has been the perpetrator in more than one human attack. It is apparent that cougars stalk people.

Bearing in mind the animal's method of attack, utmost care should be taken with survivors to document and treat cervical and facial injuries. A high index of suspicion for occult cervical injuries should direct both noninvasive and invasive studies for the purpose of evaluating vascular, esophageal, tracheal, and cervical spine injuries.

It is important to remember the well-documented infectious complications from cougar attacks. *P. multocida* infections have been previously reported in other feline bites. *Pasteurella* infection developed in one of the patients described above 1 week after injury. As such, even in the event of a negative preoperative workup, surgical debridement, irrigation, drainage, and appropriate coverage for *Pasteurella* should be performed. Although it is conservative and appropriate to assume that bite puncture wounds should not be closed, the bites that we have seen often resemble deep lacerations and avulsion injuries. These should be closed after appropri-
ate irrigation and debridement. Strong considerations should be given to appropriate drainage (either penrose or closed suction). Rabies is a concern, and rabies prophylaxis should be used in all cases until the rabies status of the attacking cougar is known. It should be remembered that the earliest documented development of symptomatic rabies occurred 4 to 5 days after being bitten.

Postoperative care should include care directed at specific injuries as well as antibiotic coverage for Pasteurella. Even so, careful wound management and surveillance should be continued until the wounds heal. Early psychological evaluation and counseling is strongly encouraged both for the victim and the victim's family.

Prevention is difficult, unless people stay out of wilderness areas that serve as habitat to cougars. Because attacks are still rare (three to six attacks per year in the United States and Canada), it is impossible to predict which mountain wilderness area to avoid. Variables include available prey for cougars and the number of cougars. The population of cougars is rising because of protection of both cougars as well as their customary prey (deer and elk). British Columbia, especially Vancouver Island, is the most frequent region of reported attacks in the past 50 years. It is important to note that adult presence or supervision is not absolutely protective. Because cougars tend to attack the last or isolated person in a group as well as attack from behind, it is advisable that adults hiking with children keep the children in front and keep close together. A large backpack may afford some protection as it blocks the cougar's attack on the victim's head and cervical region. Although an aggressive response has been shown to be effective, cougars have persisted in attacks despite victim's attempts to scare them. Running away from an attacking cougar is not possible because of their superior speed and agility, nor does "playing dead" seem to work based on several reports from survivors and witnesses. One recommendation is to stand up and maintain eye contact with the cougar at all times.

Although cougar attacks on children are relatively rare occurrences, they carry a high (25%) mortality rate. A high index of suspicion for occult cervical injuries is important to appropriate management. Surgical debridement and antibiotic coverage that includes coverage for oropharyngeal flora including *P multocida* is encouraged. Rabies prophylaxis should be instituted immediately and stopped if the attacking cougar's rabies status can be determined to be nonrabid. Although prediction and prevention of an attack on children is difficult in cougar habitat areas, placing an adult in the rear of the group and keeping children in close visual proximity may prevent attacks on the children in the group or afford protection in the event of an attack.

**REFERENCES**