

Two unusual penetrating injuries from playing ice hockey

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In late October and early November 1998, physicians in St. John's were confronted by 2 hockey-related injuries, each involving the blade of a skate. The disastrous outcome of one injury and the near disastrous outcome of the other raise several questions: Is any game worth these types of consequences? Is hockey equipment sufficiently sophisticated to offer adequate protection? Is the sport adequately regulated, especially at the professional level, with regard to the wearing of all available protective equipment? Should consenting adults be allowed to play a sport without all available equipment appropriately applied?

Case 1

On Oct. 24 a 20-year-old man was playing in a junior hockey game in a small offshore-island community of Newfoundland. Total travel time from the community to a trauma centre in St. John's is 45 to 60 minutes. There is no immediately available helicopter medevac for this community. During the game's overtime period the man tripped and fell on another player's skate, which struck his left axilla. He experienced brief but burning pain, replaced by a warm sensation. A videotape of the game by a local television station showed the patient's jersey turning red within seconds and blood flowing onto the ice almost immediately.

At least 2 things were in the man's favour. First, an ambulance was already on its way to the rink to pick up a player with a back injury and arrived within minutes after the axillary laceration. The attendants did not remove the man's hockey equipment and took him to the local hospital immediately, applying pressure as best they could. On arrival, the staff could not detect his blood pressure and were barely able to palpate peripheral pulses. Two intravenous lines were established, and 2 L of normal saline brought his blood pressure up to 80/50 mm Hg. (There are no blood products kept on the island, and the local hospital's penta-starch was out of date.)

The second piece of luck was that the 10:30 pm ferry was at the dock, loading for its last trip of the day from the island. The patient was rushed to the ferry with continued local pressure to the left axilla and intravenous saline. His total travel time was about 50 minutes. On arrival at the emergency department in St. John's his blood pressure was 60 mm Hg palpable and his pulse rate 80 beats/min. There was still brisk bleeding through the saturated bandages in

his axilla, but the left arm was warm and well perfused. He could not fully flex his second and third digits; sensation was difficult to assess but thought to be diminished in these digits. He was given O-negative blood on arrival. A 7–8 cm longitudinal laceration in the apex and anterior wall of the axilla was noted; there was some pulsatile bleeding, but no major arterial spurting. Forceps were applied to the proximal end of the injured vessel, and 4 proximal ties were put in place to stop the bleeding.

In consultation with the surgical resident and a staff surgeon — and because the patient now had a radial pulse (72 beats/min), an accurate history of the blood loss was needed, and the extent and number of injuries to the artery had to be accurately determined — an arteriogram was obtained. Because of the patient's low blood pressure, vascular access was difficult and the arteriogram took considerable time. During the procedure his blood pressure dropped to 80 mm Hg palpable and type-specific blood was transfused. The arteriogram showed a near complete transection of the axillary artery with a small amount of distal flow.

The preoperative hemoglobin concentration was 87 g/L. Aggressive transfusion was required during surgery to maintain the patient's blood pressure. The laceration to the axillary artery was debrided and repaired using a saphenous vein graft. The axillary vein was also transected and likewise repaired. No major nerve damage was seen, except for a transection to the cutaneous nerve to the medial arm. During resuscitation the patient was continuously hypotensive, although his heart rate was never greater than 80 beats/min. He received a total of 12.5 L of colloid and 7 units of packed red blood cells. His postoperative recovery was rapid and uneventful; however, he did exhibit a fairly dense median neuropathy to the left hand, which, as of January 1999, is beginning to recover.

Case 2

On Nov. 6, 1998, a 24-year-old man was injured while playing professional hockey in St. John's. As he turned to clear a puck in front of his own net, he bent forward from the waist. At the same instant a player from the opposing team turned in the opposite direction, and the heel of his blade came up and made contact with the face of the patient. The patient, who was wearing no facial protection, immediately grabbed his right eye and blood spurted between his fingers. My examination in the dressing room re-

vealed the following: the lids of his right eye were closed; the globe was obviously flat and collapsed; there was a laceration in the lower lid extending from 1 cm lateral to the lateral canthus, the full length of the lower lid curling into the medial canthus; some vitreous humour and choroid membrane were exuding through the laceration; there was total hyphema; and he had light perception only. The lid laceration was temporarily repaired, and the patient was given tetanus toxoid and intravenous antibiotics. The team ophthalmologist arrived at the rink and arranged for operating room time at the hospital to where the patient was then transported.

Three hours after the injury occurred, the patient underwent a 4-hour operation to repair the globe and the lid laceration. His parents and officials from the New York Islanders arrived the next day, and it was arranged that he be transported to Boston for further consultations regarding the viability of his eye.

On the fourth day after the injury the patient underwent enucleation of the right eye and further revisions of the lower lid to improve his ability to wear a prosthesis.

Comments

Could these accidents have been prevented? The first, probably not; the second, quite possibly. There are a number of areas that professional hockey administrators need to review because of the far-reaching financial and social implications of these types of incidents. First, players should be checked to ensure that their equipment has not been altered. Too many players do this for comfort, not realizing

that they are at increased risk of injury. For example, removing pads from pants and cutting off the tops of shin pads may lead to unnecessary contact injuries. Second, players should be checked to ensure that their equipment is adequate for protection and that all available equipment is being worn. Some helmets are so poorly designed that they do little to protect against blunt head trauma and, thus, concussion. All players, and coaches for that matter, would do well to wear specially designed anti-concussion helmets, which are available for less than \$100. Why are players, amateur and professional, not being forced to wear facial protection? Would we let our children on the ice without a neck guard or a cage or shield? Third, players should be checked to ensure that they are wearing their equipment properly. For example, many players leave the chin straps of their helmets unattached. Finally, players should be made to remove all jewellery. I am still waiting for a player travelling 50 km/h down the ice to be snagged by a heavy-duty metal chain hanging around his neck.

In other sports, amateur and professional, the onus is on the referees to see that equipment is adequate and properly applied. A neutral, off-duty referee could be the dressing inspector for hockey teams and ensure that jewellery is off and that equipment is adequate, unaltered and properly applied. Let's enjoy "the coolest game on earth" without witnessing devastating injuries.

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