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Auricular Hematoma

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Auricular hematoma, or "cauliflower ear" as it is more commonly known, is an injury that occurs to the visible portion of the external ear known as the pinna. "Auricular" refers to the auricle, another term used for the pinna, while "hematoma" is used to describe the localized, blood filled swelling that is the consequence of the trauma to the pinna. Swelling usually occurs between the skin and cartilage of the pinna, leading to a cosmetic deformity (Figure 1). If left untreated, the accumulated fluid is gradually replaced by scar tissue, and a permanent deformity can result.

Auricular hematoma is generally seen in contact sports where ear protection is optional or not required by participants. Wrestling, judo, rugby and boxing tend to have the highest incidence of auricular hematoma among competitive sports, with rates as high as 40% seen in some groups of athletes. Headgear, while not always successful in protecting against auricular trauma does appear to decrease the incidence of injury.

Treatment of auricular hematoma usually takes place in the physician's office. Athletic trainers may also assist in

treatment, particularly if a simple procedure is used; this will be discussed later. There are several treatment options available, but the basic premises in most of these are (1) remove the hematoma formation, and (2) prevent reaccumulation of the hematoma. To better understand injury and treatment of auricular hematoma, a brief overview of external ear anatomy is warranted.

Anatomy and Mechanism of Injury

The external ear is comprised of the external auditory meatus (or ear canal) and the pinna (or auricle). The pinna is the visible portion of the external ear, and this is where auricular hematoma most often occurs. Its primary purpose is for the collection of sound waves, which are then transmitted to the inner ear. The pinna's layers consist of: (1) the epidermis, or outermost layer of skin, (2) the dermis, or deep skin layer, and (3) the elastic cartilage, which gives the pinna shape and support. This cartilage is sandwiched between two layers of perichondrium, a connective tissue which is actually part of most cartilage. In the normal pinna, the anterior (or lateral) skin is fixed firmly to the elastic cartilage. By contrast, the posterior (or medial) pinna has a large amount of adipose (fatty) tissue that separates the skin from the cartilage. Therefore, the posterior skin shows a better ability to "give and slide" when exposed to trauma than does the anterior skin, which is firmly adherent to the

cartilage. This is the difference which dictates that most auricular hematomas anteriorly.

As stated before, auricular hematoma most often occurs as a result of direct contact to the exposed pinna. Usually a shear force or "tearing" component is present with the direct contact. While the posterior pinna has the ability to withstand the shear force due to the greater amount of adipose tissue (and the increased ability to slide), the anterior skin/cartilage interface does not slide as readily and is more easily disrupted. Thus, when direct contact and a shear force are combined on an exposed pinna most damage occurs anteriorly. Hemorrhage and edema, the by-products of injury, start accumulating within the cartilage layers. If the hematoma is not removed within seven to ten days after its formation, it will gradually be replaced by scar tissue, and permanent deformity is almost inevitable. Part of the challenge in treating auricular hematoma is preventing the reaccumulation of the hematoma to ensure that fibrosis and scar tissue formation do not occur.

Treatment of Auricular Hematoma

Most modern treatment of auricular hematoma involves aspiration (removal) of the hematoma by the physician using a hypodermic needle. After cleaning the pinna with Betadine or similar solution, a local anesthetic may be injected prior to aspiration to decrease discomfort of the athlete. Once the

anesthetic takes effect, as much of the hematoma as possible is withdrawn using sterile needle and syringe (Figure 2). An athlete's compliance is key at this time. The longer the athlete waits to see the physician, the more the hematoma solidifies and becomes fibrotic; thus there is less fluid that can be aspirated.

After this is complete, the choice of how to prevent reaccumulation of the hematoma needs to be made. There are basically two categories of treatment used, noninvasive and invasive. Noninvasive, or simple procedure, involves the application of an external pressure dressing to the pinna to prevent reaccumulation of fluid. These dressings include either cotton wool, cast padding and/or gauze bandage soaked with a substance called flexible collodion, which adds rigidity and adherence to the materials when dry, creating a cast-like, compressive state around the anterior and posterior pinna (fig 3). Swimmers noseclips may also be incorporated into collodion casts to aid in increasing pressure locally on the hematoma site. The casts are usually left in place as long as possible for up to ten days after application, and can be worn through training and competition, preferably in conjunction with headgear. Many times, reapplication of the cast by the physician or the team athletic trainer may be necessary especially if it is exposed to excessive water, sweat or rough handling. At this time, further aspiration may also be needed, depending on how much fluid reaccumulates while the cast is absent.

Another simple technique is the application of a silicone splint following aspiration. The silicone and hardening material are mixed then applied to the anterior and posterior pinna and allowed to harden, creating a cast like state seen with the cotton/collodion dressings. This dressing may need to be held in place with a head bandage, depending on what technique is used. While the noninvasive methods are relatively simple, infections can still occur. The physician should check regularly for signs of infection, pressure necrosis or contact dermatitis when these procedures are used.

Invasive procedures involve suturing of objects, such as cotton bolsters or sterile buttons to the pinna to prevent reoccurrence of the hematoma. Invasive procedures may also involve inserting a small drainage tube temporally to help prevent fluid reaccumulation. After the hematoma is aspirated as previously described, further local anesthesia is administered around the pinna. An incision may be made either anteriorly or posteriorly along the pinna to remove any leftover portion of the hematoma. Depending on the procedure used, either small cotton bolsters or sterile buttons are sutured to the anterior and posterior pinna in the area of the injury, thereby "sandwiching" the pinna and providing long term compression needed to discourage fluid reaccumulation. Modifications of the procedures, such as collodion soaked cotton placed between the buttons, are used with the physician's discretion.

An invasive technique which employs a portable suction

drain is also an option. An incision is made in the posterior pinna between the perichondrium and anterior dermis, and a small tube is placed inside this space. The tube leads to a drain which is worn by the athlete, held in place with adhesive tape to the body. The drain helps remove the fluid as it forms, and is usually removed seven to ten days after it has been inserted.

Invasive procedures are more involved than noninvasive procedures for both the physician and athlete. The chances for localized infection are increased with an invasive procedure; therefore, it is imperative that the ear is checked daily for signs of infection including redness, warmth, swelling and fever. Antibiotics are usually prescribed by the physician in such cases. In addition, an athlete may not necessarily return to practice or competition immediately following an invasive procedure, but again this is the physician's decision. Long term results are generally good with an invasive procedure because the dressing and sutures stay in place more readily than collodion/cotton dressings, thereby eliminating the need for repeated aspirations and applications.

In Conclusion

Auricular hematoma is a condition which, left untreated, can cause permanent cosmetic deformity of the external ear. Treatment of this injury should take place quickly so

permanent changes in the pinna do not occur. There are many treatment options available, but most revolve around two basic principles: removing the hematoma and preventing it's reaccumulation. The complexity of treatment can vary greatly as can the result. As is the case in most sport related injuries, prevention is often the best treatment. Wearing proper ear protection whenever possible in practice and competition is an athlete's first line of defense against sustaining auricular hematoma; often this is also the best defense.

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