Auricular haematoma

Auricular haematomas typically occur as a result of the auricle being pulled or subjected to blunt trauma in association with contact sports, accidents or violence. An auricular haematoma requires prompt surgical intervention to avoid cauliflower ear, also known as «wrestler's ear». A cauliflower ear is a permanent deformity made up of connective tissue and cartilage.

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MAIN POINTS

- Auricular haematoma can lead to necrosis of cartilage
- Untreated auricular haematoma can give rise to permanent deformity, so-called «cauliflower ear»
- The recommended treatment is rapid evacuation of the haematoma and subsequent pressure dressing
- Surgical correction of cauliflower ear involves difficult reconstructive plastic surgery

The ear is supported by a scaffold composed of several cartilaginous components: the helix, antihelix, concha, tragus and antitragus. The skin covering this cartilage scaffold is extremely thin with virtually no subcutaneous adipose tissue, and is also strongly adherent to the underlying perichondrium. The perichondrium is richly vascularized and supplies the avascular cartilage with blood (1).

In an auricular haematoma, blood accumulates in the layer between the perichondrium and cartilage. The haematoma thus forms a mechanical barrier between the cartilage and its blood supply from the perichondrium (2). Deprived of sufficient nutrients, the cartilage may become necrotic and/or infected. This will eventually trigger disorderly fibrosis and cartilage formation around the various cartilaginous components (3).

As a consequence, the normally concave structure of the ear becomes filled with connective tissue. The cartilage subsequently deforms and buckles, giving rise to variants of so-called «cauliflower ear» (Figure 1). Rapid evacuation of the haematoma restores close contact between the cartilage and perichondrium, thereby reducing the likelihood of deformity.

This article provides an overview of the management of auricular haematomas. Knowledge remains limited with respect to the optimal technique for acute treatment (4). The literature consists of a small number of case reports, systematic reviews and clinical practice guidelines.

The article is based on the authors' own experience of working in the Accident and Emergency department and as plastic surgeons, as well as on a review of the guidelines provided by UpToDate (5) and a selection of articles obtained through searches in PubMed and McMaster PLUS.

Clinical presentation

An auricular haematoma typically presents as a tender, tense and fluctuating swelling on the anterior surface of the ear, with mild to moderate throbbing pain. Most patients seek medical advice primarily because of the visible swelling or because they have additional injuries that they wish to have examined (head/neck injury, lacerations etc.).

In the Accident and Emergency department, a patient with an auricular haematoma will often have many other injuries too – especially if those injuries were sustained as a result of violence. Auricular haematoma is thus easily overlooked unless a specific effort is made to rule it out during the clinical examination.

The haematoma typically fills the hollow between the helix and the antihelix (scapha) and extends forward into the fossa triangularis. Less frequently, the haematoma may occupy the concha or the area in and around the external auditory meatus. It is important to be aware that an auricular haematoma may also occur on the posterior surface of the ear, or possibly on both surfaces, although this is less common (1). The risk of necrosis is greater if haematomas are present on both anterior and posterior surfaces (6).

The overlying skin may have normal colouration, or may be erythematous or ecchymotic. The mechanism of injury will determine whether ulceration or lacerations are present: these are more common with sharp force trauma (e.g. injuries caused by glass). The skin is usually intact and the haematoma feels soft upon palpation. Approximately 24 hours post-trauma, the blood will clot and the swelling may become firmer.

It is important for the examining clinician to rule out other serious injury in patients with auricular haematoma, in particular head and/or neck injury. The anamnesis should clarify any loss of consciousness, amnesia and the use of anticoagulants. It is essential to keep in mind that the patient may have been subjected to violence. Otoscopy should also be performed on both ears to exclude perforation of the eardrum and haematotympanum (7).

Treatment

Acute evacuation is required for all auricular haematomas (4, 5). Needle aspiration or incision and drainage can be performed by

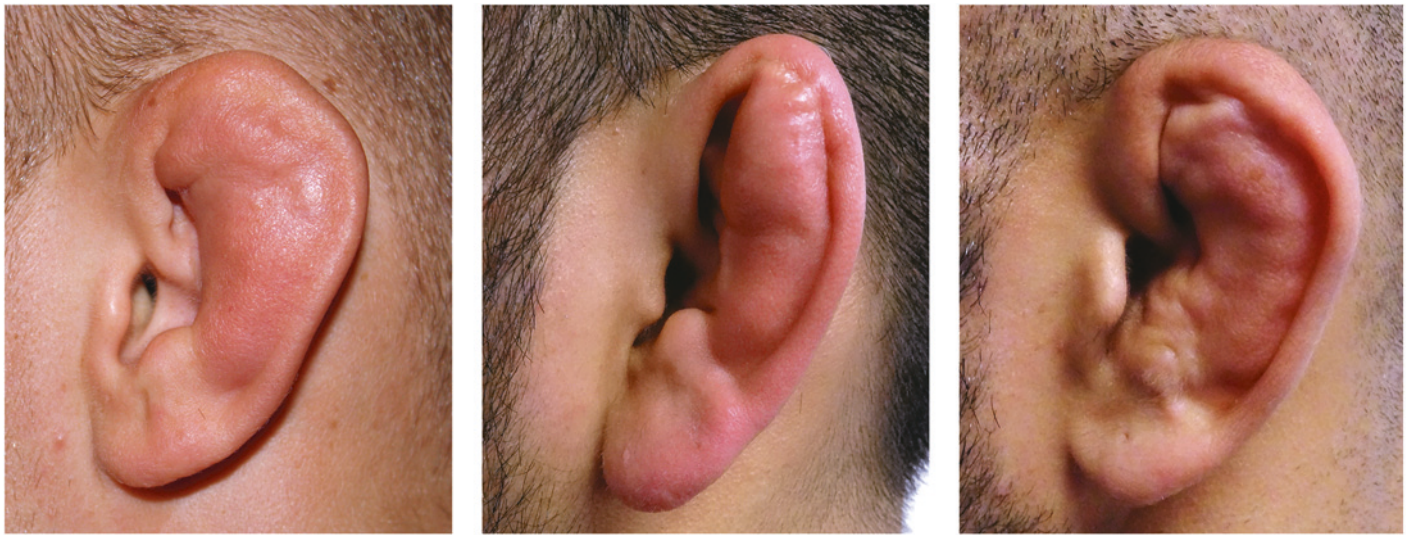

Figure 1 *An untreated auricular haematoma can lead to cauliflower ear. Above, three patients with permanent and solid cauliflower ears as a result of failure to evacuate the haematoma. Photographs: Christoffer Aam Ingvaldsen*

the GP/Accident and Emergency doctor. It is important for this to occur as quickly as possible so that the cartilage does not become necrotic.

An alternative approach is required if the haematoma is more than seven days old. Such haematomas will often be more organised and more difficult to drain. There may also be ulceration and/or necrosis of the skin, in which case the patient should be referred to an otorhinolaryngologist or plastic surgeon.

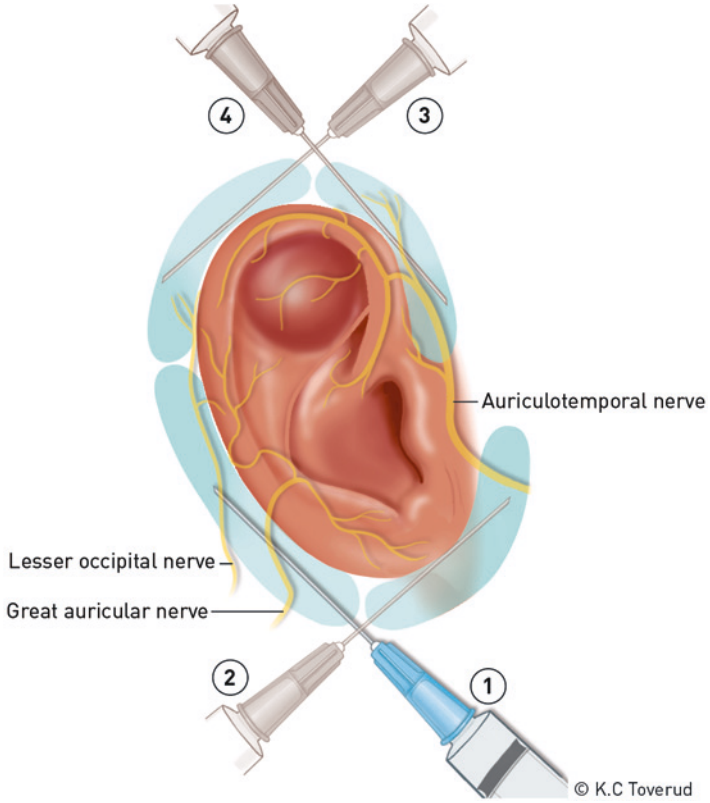

Figure 2 *Regional auricular block is indicated for the evacuation of larger auricular haematomas. This provides good anaesthesia while avoiding the introduction of additional volume into the already tense and traumatised tissue. Xylocaine with supplemental adrenaline is injected via a thin cannula into the skin, as shown here. Two injection sites are usually sufficient. The anaesthetic is injected in a V-shape underneath the ear and an inverted V-shape above the ear. Optimal effects are achieved after ten minutes. The nerve block anaesthetises anterior and posterior surfaces of the ear in their entirety, with the exception of the area in and around the external auditory meatus, which is innervated by branches of the vagus nerve*

Evacuation of the haematoma

The procedure should be performed under regional auricular block (5). We recommend Xylocaine 1 % with adrenaline. Good results can also be achieved with infiltration anaesthesia, but this should be reserved for the smallest haematomas (less than 2 cm). Supplemental adrenaline is recommended with regional auricular block, but must not be used with infiltration anaesthesia (5).

It is important to disinfect the ear and the surrounding skin first. Sterile sponges should be moistened with chlorhexidine spirit 5 mg/ml (0.5 %) and applied for at least two minutes. The spirit should be allowed to air dry prior to perforation of the skin. Figure 2 illustrates how to perform a regional auricular block.

The recommended treatment will depend on the size and age of the auricular haematoma (5). As stated above, if the haematoma is more than seven days old, the patient must be referred to an otorhinolaryngologist or plastic surgeon for revision and, if necessary, reconstruction.

Needle aspiration is recommended if the auricular haematoma is < 2 cm in diameter and < 48 hours old. Green (21 gg) or pink (18 gg) cannulae are suitable. The insertion site should ideally be at the base of the haematoma. It is not necessary to insert the needle into or through the cartilage. If aspiration of the haematoma proves difficult, this is probably because the blood has fully or partly coagulated. Incision and drainage should then be considered.

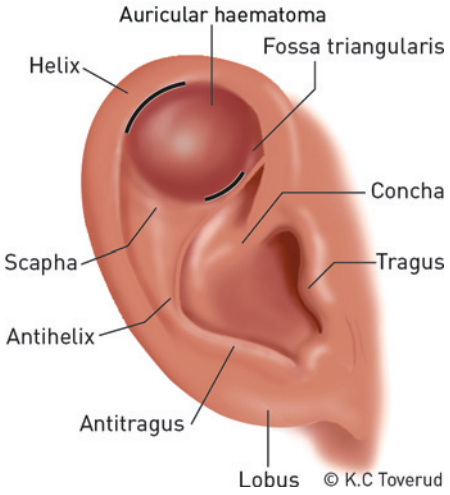

Figure 3 *Illustration of the surface anatomy of the ear and the typical location of an auricular haematoma (in the cranial part of the scapha and extending into the fossa triangularis). The heavy lines in black are suggested incisions along the antihelix and helix*

Incision and drainage is recommended if the auricular haematoma is ≥ 2 cm in diameter or > 48 hours old (5, 8). The incision should be made at the base of the haematoma. If the haematoma is located in the scapha and/or fossa triangularis, the incision should be directly above the contour of the antihelix. Such incisions often yield good cosmetic results. Alternatively, the incision may be made just underneath the edge of the helix, so that the scar will be at least partially hidden. The incision must be sufficiently large to allow evacuation of the coagula. Figure 3 illustrates the surface anatomy of the ear and a typical auricular haematoma.

Cutting down into the cartilage should be avoided: if the haematoma empties, the incision is sufficiently deep. If necessary, the incision can be enlarged slightly using a small pair of scissors or tissue forceps. When the haematoma has been drained, the area should be rinsed with sterile saline until the liquid runs clear. The incision can then be closed with, for example, 5–0 non-absorbable nylon sutures. Mattress stitch is recommended. The surgical needle must pass through the skin, perichondrium and cartilage on both sides of the incision. The aim is to achieve good contact between the layers. A small area outermost in the incision is left open to allow drainage.

After surgery, a pressure dressing is applied with the vaseline-impregnated gauze innermost, followed by a sterile saline dressing and dry bandage. It is often necessary to wrap an elastic bandage around the head to ensure sufficient pressure against the surface of the ear.

Antibiotic prophylaxis

An area with little blood supply is vulnerable to infection. It is recommended that all patients receive 7–10 days of antibiotic prophylaxis (5). One option is dicloxacillin (capsules) 500 mg three to four times daily until removal of sutures; this will cover penicillinase-producing staphylococci, which are responsible for numerous wound infections.

Aftercare

We recommend that the wound is checked two or three times over the first five days to evaluate reaccumulation of the haematoma and/or infection. The pressure dressing should be changed each time the wound is checked. If reaccumulation of blood has occurred, aspiration and/or incision can be repeated. If the incision and drainage process is complete, the pressure dressing may be removed after three days. Sutures are removed after 7–10 days.

If the patient actively participates in risky activities (e.g. wrestling), we recommend that he or she abstains from such activities in the week after treatment. The use of head protection (scrum cap) or ear taping (often used in rugby) should also be encouraged.

Reconstruction of cauliflower ear

Many of those who take part in boxing, wrestling, martial arts and rugby do not consider cauliflower ears to be unsightly – quite the opposite in fact. We have been in contact with members of this community in Oslo, and it appears that many individuals avoid having haematomas drained. Cauliflower ears may form part of an image and be seen as a badge of honour. Our impression is that only a minority of these patients seek medical advice and treatment.

Many athletes and participants in contact sports do change their minds later on in life, however, often in connection with choosing/changing careers. Some also report pain/discomfort when trying to sleep or when pressure is applied to the ear. These individuals occasionally seek surgical correction (9).

Surgical correction of a manifest cauliflower ear is a challenging reconstruction. Reconstruction techniques in which the deformed connective tissue and cartilage are excised and/or remodelled by means of suitable incisions are described in the literature (9–11).

In severe cases in which most of the ear cartilage has been lost, cartilage from the rib can be used to reconstruct the cartilaginous components of the ear. This type of reconstruction is performed regularly at Rikshospitalet in association with congenital malformations of the ear (anotia/microtia), but has yet to be performed in a patient with cauliflower ear.

Conclusion

GPs and staff in the Emergency Ward/Accident and Emergency department should have knowledge of auricular haematomas and of the importance of rapid treatment. An auricular haematoma may lead to necrosis of cartilage, which will leave the patient at risk of ulceration and cauliflower ear. The clinician who examines the patient should attempt to evacuate the haematoma (rather than referring the patient onwards), as prompt treatment reduces the risk of permanent deformity.

The optimal method for evacuating a haematoma is dependent on the size and age of the haematoma. If the clinician is uncomfortable with applying a regional auricular block and/or making an incision in the ear, needle aspiration under sterile conditions may be attempted instead. It may be possible to perform needle aspiration without auricular block or infiltration anaesthesia. If the patient consents, such treatment is better than waiting and potentially allowing the cartilage to become necrotic.

Patients with older auricular haematomas or manifest cauliflower ears should be referred to an otorhinolaryngologist or plastic surgeon for treatment and assessment of options for reconstruction.

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