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Needlefish Injury to the Orbit in the Adriatic Sea

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SUMMARY

Needlefish have inflicted serious and even fatal injuries to humans. These injuries are rare, especially in the orbital region. This paper documents the case of a 37-year-old woman with an orbital injury caused by a needlefish beak. The patient presented to our ophthalmology emergency room in September 2016. During her swim on the day of injury, a fish jumped out of the sea and collided with her right eye region. Upon examination, a foreign body was visible in the inferior lateral conjunctival fornix and it penetrated deep into the orbit. This resulted in an eye movement disorder and pain during eye movement due to the residual foreign body in the orbit. The eye globe itself was not injured. The foreign body was fully removed after two operative procedures. The patient experienced a complete recovery without any diplopia or damaged vision and had no residual symptoms after 5 years of follow-up. To our knowledge, this is the first reported case of needlefish injury in the Adriatic Sea.

KEYWORDS

Needlefish; Garfish; Orbital injury; Marine injury; Orbital foreign body

Introduction

Needlefish (family Belonidae), also sometimes called “garfish” or “long tom” in other parts of the world, are found in the Pacific and the Atlantic ocean, as well as the Baltic, Red and Mediterranean sea. They have long cylindrical bodies with a sharp beak resembling a spear and can grow up to 1 m in length. Needlefish are capable of swimming as fast as 60 km/h and jumping high out of the water. Usually they swim in groups. Their habitat is in shallow waters, but they can be found in deeper waters as well. These fish are predators and they eat smaller fish, but can also become prey for larger fish. When chasing food or fleeing from predators, or even when attracted to bright lights, they make sudden high leaps out of the water[1]. They rarely cause injuries to humans, but the medical literature and newspapers feature reports of them causing injuries — mostly to fisherman and windsurfers, and rarely to swimmers — sometimes with deadly consequences[2-7].

Case

A 37-year-old woman presented to the emergency department in September 2016 with an injury to the right orbit. She had been swimming that day near the coastal town of Pag in the Adriatic Sea and reported that a fish had jumped out of the sea and collided with her right eye region.

She was examined by a local ophthalmologist who noted a visible large foreign body in the inferior fornix of the right eye and referred her to Sestre milosrdnice University Hospital Center for further treatment.

Our examination revealed a large foreign body in the inferior lateral conjunctival fornix penetrating laterally into the orbit. This resulted in restricted movements of the right eye, binocular diplopia and pain during eye movements.

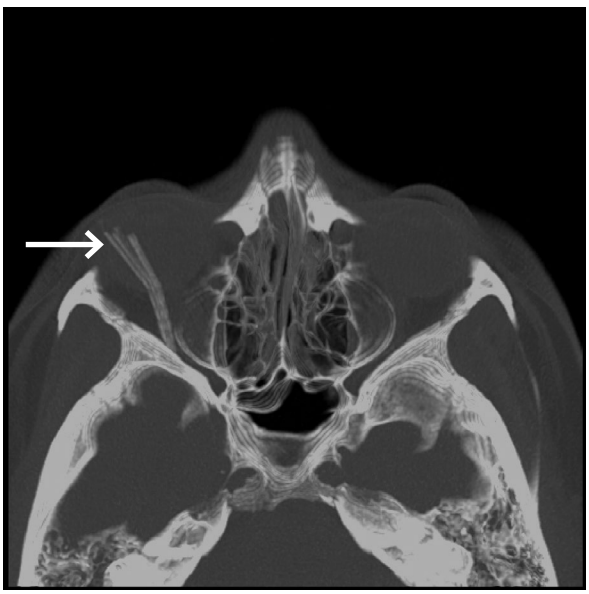

FIG. 1 The CT scan showed multiple foreign bodies (white arrow) in the right temporal infraorbital region with a point of entry in the lower eyelid area and pieces pointing in the medial direction toward the apex of the orbit. The foreign body was partially broken behind the posterior pole of the globe. The foreign body ended next to the posterior third of the lateral rectus muscle.

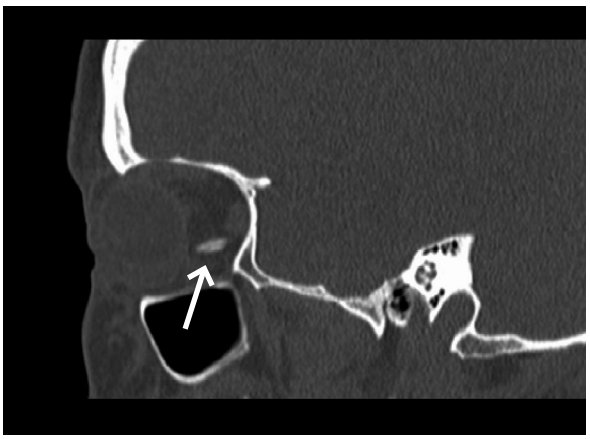

FIG. 2 A repeated CT scan showed a residual foreign body (white arrow) seen in the retrobulbar space next to the posterior third of the lateral rectus muscle.

The eye globe itself was not injured, and the anterior and posterior eye segments were normal.

A CT scan showed multiple foreign bodies in the temporal infraorbital region with a point of entry in the lower eyelid area, with pieces pointing in the medial direction (Fig. 1). The foreign body was partially broken behind the posterior pole of the globe and ended next to the posterior third of the lateral rectus muscle.

Surgery was performed under general anesthesia on the day the injury occurred and the anterior part of the needlefish beak was retrieved. The part of the beak positioned in the retrobulbar space broke off during extraction and could not be found during the first surgery. On a repeated CT scan, the lost beak piece was seen in the retrobulbar space next to the posterior third of the lateral rectus muscle (Fig. 2). In the second surgery, we were able to find and remove the lost part of the beak using the presumed injury trajectory canal.

The patient had transient diplopia during the first postoperative month but she has fully recovered after that without any diplopia or damaged vision, and had no residual symptoms after 5 years of follow-up.

We treated our patient with ciprofloxacin 2 g intravenously from the first day of admission for 10 days. Three days after starting antibiotic therapy, we introduced an oral corticosteroid — methylprednisolone 1mg/kg — to reduce any inflammatory reactions and ranitidine 2 × 150 mg for gastroprotection.

Discussion

Needlefish have a long spear-like beak with two narrow jaws and small sharp pointed teeth. Their sharp beaks are capable of inflicting deep puncture wounds and often break off inside the victim in the process[2-16].

The CT scan was beneficial for discovering the location and size of the foreign body in the orbital cavity. CT scans should be repeated in case of suspicion of any foreign body residue, as in this case; we assumed that the beak broke upon impact with the lateral orbital wall.

This proved to be a very demanding case, because it was our first encounter with this kind of injury and the type of foreign body was unknown to us before surgery. Only after removing the first part of the foreign body did it become clear that it was a fish beak. Furthermore, during the extirpation of the foreign body, there was no clear “end” to the needlefish beak, so the surgeon could not, at that time, tell by inspection of the removed material if it was entirely removed. When removing beak pieces, care must be taken to remove them completely in one take if possible, or to remove the upper and lower jaw separately with extreme care, as sharp teeth can damage the globe, eye muscles, vessels or nerves.

After the control CT scan, we determined that there was a residual piece behind the globe next to the lateral rectus muscle.

We were not sure if we would be able to retrieve this through orbitotomy, so the second surgery was performed in collaboration with a maxillofacial surgery team in University Hospital Dubrava, Zagreb. Together we were able to find the lost piece of the beak in the lateral part of the orbital apex through the presumed trajectory canal and remove it without damaging the eye or the optic nerve. During surgery, a rhinoscopy speculum proved to be a useful instrument for visualizing the deep orbital space and finding the lost piece.

Needlefish are carnivorous and their dentition can be a source of *Vibrio* bacterial infection. Antibiotic therapy for any marine-acquired infection should include therapy against the *Vibrio* genus. *Vibrio parahaemolyticus* or *Vibrio vulnificus* should be suspected in patients with rapidly progressive cellulitis or myositis from a marine injury. The recommended antibiotics should include intravenous third generation cephalosporins, ciprofloxacin or imipenem-cilastatin[16,17]. According to this recommendation, our patient was treated with ciprofloxacin 2 g IV for 10 days and the oral corticosteroid methylprednisolone 1 mg/kg to reduce inflammatory reactions.

Conclusion

We presented the case of a penetrating orbital injury with a residual foreign body, more specifically a needlefish beak. The treatment of this kind of injury is similar to treating a stab wound. A high degree of suspicion of foreign body retention should be held in any case of needlefish injuries. A CT scan will show the size and location of the foreign body, and surgical removal often demands a skillful surgical team. Appropriate antibiotic therapy for marine-acquired injury is mandatory.

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SAŽETAK

Orbitalna ozljeda uzrokovana ribom iglunom

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Ribe iglice mogu uzrokovati teške i ponekad po život opasne ozljede. Ovakve ozljede su izuzetno rijetke, naročito u orbitalnoj regiji. Izvještavamo o orbitalnoj ozljedi 37-godišnje pacijentice uzrokovane kljunom ribe iglice koja je upućena u našu hitnu oftalmološku ambulantu u rujnu 2016. Pacijentica navodi kako je tog dana za vrijeme kupanja u moru zadobila udarac nakon što je riba isplivala velikom brzinom iz mora i udarila je u područje desnog oka. Tijekom kliničkog pregleda uočeno je strano tijelo locirano u donjem lateralnom konjuntivalnom forniksu koje penetrira u dubinu orbite. Prisutnost stranog tijela ograničavalo je pokrete očne jabučice i uzrokovalo bolove tijekom pokreta. Sama očna jabučica nije bila ozlijeđena. Riblji kljun uklonjen je u potpunosti nakon dva operativna zahvata. Pacijentica se u potpunosti oporavila bez rezidualnih simptoma diplopije ili utjecaja na vid. Prema našem saznanju ovo je prvi slučaj ozljede orbite kljunom ribe iglice u Jadranskom moru.

KLJUČNE RIJEČI

Iglun; Orbitalna ozljeda; Ozljeda urzrokovana ribom; Orbitalno strano tijelo