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Clinical Records

Necrotizing fasciitis: a rare occurrence in the external auditory meatus

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Abstract
The diagnosis and management of a patient with a sloughing otitis externa thought to be necrotizing fasciitis is described. The clinical characteristics of this condition, diagnostic difficulties faced and a brief literature review are presented.

Key words: Fasciitis, Necrotising; Ear, External

Case report

A 39-year-old male presented to the Ear Nose and Throat out-patient clinic with a history of intermittent pain and discharge in his right ear for nearly three weeks. There was neither hearing loss nor vertigo, and the other ear was symptom free.

There was no history of ear problems in the past; no preceding history of swimming, trauma or upper respiratory tract infection. He was otherwise fit and well.

Examination revealed a tender pinna and the ear canal was swollen, erythematous and tender. The ear canal was full of debris, which was micro-suctioned revealing an intact and normal tympanic membrane. The left ear was healthy. The initial diagnosis was otitis externa (OE) of the right ear and a swab was taken for culture and sensitivity. An otowick (expanding sponge wick) was inserted and regular instillation of Gentisone HC® eardrops was commenced. Review after a week showed good response, however, the patient returned six weeks later with pain and discharge from the same ear. Similar findings were noted and a fresh swab was taken for further microbiological examination. Routine blood tests including blood glucose were within normal range. Culture of the ear swab from his previous visit grew *Staphylococcus* and *Bacteroides* spp, which were sensitive to Gentamicin. Microsuction was carried out revealing an intact and normal tympanic membrane. An otowick was inserted with a plan to change on alternate days. A further course of Gentisone HC® eardrops was commenced in addition to oral flucloxacillin and analgesics.

Two weeks later his ear looked better, but his symptoms recurred within four weeks. On this occasion micro-otoscopy revealed a greyish black slough in the external auditory meatus (EAM) partly filling the canal (Figure 1). The limits of the slough appeared to correspond to the cartilaginous part of the meatus. The bony part of the EAM was found to be unaffected, as was the tympanic membrane.

Fig. 1
The limits of the greyish black slough corresponding to the cartilaginous part of the external auditory canal.

Further investigation did not reveal any immune deficiency. The slough was excised from the canal and sent for histological and microbiological examination. A bismuth and iodoform paraffin paste (BIPP) on ribbon gauze was inserted and the patient was admitted for intravenous antibiotics (cephalosporin and metronidazole) and a daily change of the antiseptic dressing.

The clinical picture was thought to raise the possibility of necrotizing fasciitis of the EAM. The histology of the specimen showed necrotic tissue and mature cartilage and sparse inflammatory reaction. *Bacteroides* spp and *Staphylococcus aureus* consistently grew in the culture. Magnetic resonance imaging (MRI) and computed tomography (CT) scan revealed no evidence of deep tissue involvement or parapharyngeal spread. In particular there was no bone involvement including the bony part of the EAM.

Further debridement of the dead tissue was carried out, and the antibiotics were continued intravenously considering the potential risk of necrotizing fasciitis. A desloughing agent (Aserbine®) was used topically in the EAM, and the

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TABLE I
COMPARISON BETWEEN NECROTIZING FASCIITIS AND NOE

Necrotizing fasciitis	Necrotizing otitis externa (NOE)
Organisms *Bacteroides* sp *Staphylococcus aureus*	Organism *Pseudomonas* sp
Bone un-involved	Bone involved
Histology- necrosis of dermis, epidermis and subcutaneous fat	Muscle and deeper structures necrosed
CT scan shows subcutaneous air collection	Bone erosions and osteomyelitis
Any age involved	Older age
Risk factors uncommon	Risk factors common

wound was allowed to heal by secondary intention. After six weeks there was a slow but steady improvement in the patient's condition.

Discussion

Necrotizing fasciitis in general is an uncommon, potentially fatal, bacterial infection of the subcutaneous tissues. It is usually an acute and fulminant infection, but can be subacute.[1] The less known subacute cases present with symptoms over days or weeks usually with localized disease.[1] Necrotizing fasciitis can frequently affect the head and neck region with significant mortality and a rare case of perichondritis of the pinna leading to necrotizing fasciitis has been reported.[2]

Any age group may be affected including neonates. The portal of entry is usually a site of trauma such as an abrasion, laceration, insect bite or surgical wound. Sometimes the minor trauma may have been forgotten. Immuno-compromising conditions such as diabetes, arteriosclerosis, alcoholism and i.v. drug abuse can predispose to necrotizing fasciitis.

Although it is a rapidly spreading infection it may remain localized and is not always associated with sepsis.[1,3] The severity and the spread of the infection vary depending on the aetiology, the anatomical barrier and the tissue planes that are predominantly affected. The diagnosis is based on history with supportive evidence from microbiology, histopathology and radiology.[4] Commonly implicated organisms in necroticizing fasciitis are GroupA betahaemolytic streptococci and Bacteroides spp, *Staphylococcus aureus*, peptostreptococci and *Streptococcus viridans*.[3]

Histologically, oedema and dissolution of the ground substance of the dermis will be seen in the early phase of necrotizing fasciitis, which then progresses to necrosis of the epidermis, dermis and subcutaneous fat with mild inflammatory reaction. Collagen fragmentation and widespread micro-vascular thrombi are observed in the subcutaneous plane. Deeper structures of muscle, bone, ligaments and tendons are usually spared.[3,5]

A high index of suspicion is essential for the early diagnosis of this condition. Effective management includes appropriate investigations, broad-spectrum antibiotics, debridement of dead tissues, that may be repeated to avoid complications. Wounds in the head and neck may be allowed to heal by secondary intention without compromise of the results.

The characteristic demarcation of the lesion between bony and cartilage portions of the EAM prompted the diagnosis of necrotizing fasciitis in our case. The bony portion of the EAM was unaffected, as there is no subcutaneous plane. The other possible diagnosis was necrotizing otitis externa (NOE) commonly known as malignant otitis externa. Table I compares the features of the two conditions and the conclusion was that the most probable diagnosis was necrotizing fasciitis. This was managed with intravenous antibiotics, repeated debridements, and application of desloughing agent. The wound eventually healed by secondary intention. The tympanic membrane was unaffected throughout the course of the disease, and normal hearing was maintained. Ten months after the original episode, the ear canal healed with some scarring but there was no stenosis. However, the patient produced only little cerumen in that ear compared to the other ear presumably because of the damage to the subcutaneous, ceruminous glands.

As far as we are aware this is the first reported case of necrotizing fasciitis in the EAM in the literature.

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