Necrotising fasciitis as a complication of botulinum toxin injection

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ARTICLE

Abstract

Purpose **To highlight the need for early diagnosis and treatment of the rare condition of necrotising fasciitis as a complication of botulinum toxin injection, and to illustrate that injections in immunocompromised patients carry a rare but serious risk.**

Results and methods **A case report is presented of an 80-year-old woman suffering from blepharospasm and chronic myeloid leukaemia, who developed necrotising fasciitis 3 days after a botulinum toxin injection.**

Conclusions **Chronic debilitating processes such as diabetes, alcoholism and polymyositis have been suggested as predisposing factors in the development of necrotising fasciitis. We believe this is the first reported case of necrotising fasciitis occurring secondary to a botulinum toxin injection. The fact that this infection extended through the fascial planes and led to the death of muscle was, probably, because an inoculum was introduced directly into the muscle at the time of botulinum toxin treatment. This may have led to its deep spread and difficulty in debriding the area. Chronic myeloid leukaemia does not in itself cause significant immunosuppression, but our patient was on anti-proliferative treatment and had a low leucocyte count, which may have been a predisposing factor in this case.**

Key words Necrotising fasciitis, Face, Botulinum toxin, Chronic myeloid leukaemia, Subcutaneous injection

Necrotising fasciitis is a rapidly progressive condition involving fascial and subcutaneous fat necrosis secondary to subcutaneous infection. Necrosis of the overlying skin occurs due to thrombosis of the perforating vessels and the infection spreads along the fascial planes. In the face it usually spares the muscle layers.[1]

Necrotising fasciitis was first described by Joseph Jones in 1871, who saw it in the wounds of casualties in the American Civil War; he called it 'hospital gangrene'.[2] In 1924 Meleney described 20 cases in which he thought the causative agent was the haemolytic streptococcus.[3] Newer microbiological culture techniques have shown that infections of the limbs and trunk are polymicrobial, whereas infections of the face appear to be due to the β-haemolytic streptococcus, usually alone but occasionally with *Staphylococcus aureus*. In 1952 Wilson used the term necrotising fasciitis, which is preferred as it describes the most consistent feature of the disease.[4]

We report a case of necrotising fasciitis secondary to periocular botulinum toxin injection, in which the presumed direct inoculation of bacteria led to death of all tissue down to bone.

Case report

An 80-year-old woman was referred to the Eye Casualty by her general practitioner. Three days previously she had received a botulinum toxin injection for bilateral blepharospasm. The next day she had noticed swelling and redness around her right eye that was increasing.

The blepharospasm had been diagnosed 11 years previously and had been successfully treated with routine botulinum toxin injections every 3 months since December 1994. A standard technique was followed: a 500 u vial of botulinum toxin was diluted with 2.5 ml normal saline (200 u/ml), the skin was cleaned with a pre-injection swab (70% v/v isopropyl alcohol), and at four points around each eye 0.1 ml of the solution (20 u) was injected subcutaneously with a 25 G needle.

Her only other medical problem was well-controlled (chronic phase) chronic myeloid leukaemia diagnosed in 1991, currently treated with hydroxyurea and aspirin. At a haematology clinic 2 weeks prior to this admission her blood count was Hb 13.3 g/dl, WCC 4.8×10^9/l and Plt 1080×10^9/l.

On presentation to the Eye Department she was apyrexial and had a pre-septal cellulitis around her right eye. She was admitted under the care of the haematologists, blood cultures were taken and she was started on intravenous ampicillin and flucloxacillin. On admission her full blood count was Hb 11.0 g/dl, WCC 5.2×10^9/l, Plt 482×10^9/l. Over the next

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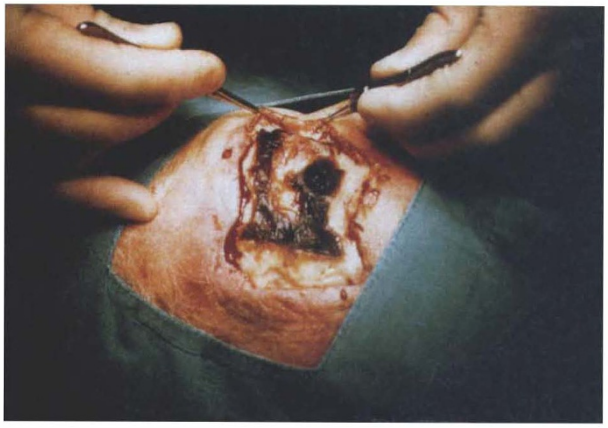

Fig. 1. *Photograph prior to the first debridement, showing a rectangular area of necrosis surrounding the right eye.*

4 days there was a deterioration in her condition. The erythema and swelling spread to involve the lower two-thirds of the right side of her face and neck. An area thought to be haemorrhage surrounded the right eye. She was, however, systemically well and orientated.

Four days after admission a rectangular area of necrosis corresponding to the area injected with botulinum toxin was evident around the right eye (Fig. 1). The eye could not be opened and a raised edge of infected tissue was standing proud of the necrotic area. The eyelid margins were healthy. By manually opening the eyelids the conjunctiva was noted to be grossly chemosed. Examination of the left eye was normal, visual acuity 6/6. A diagnosis of necrotising fasciitis was made and concern was raised about the possibility of orbital extension. She underwent an emergency debridement of the affected periorbital area. The necrotic tissue was excised from an area bounded by her right temple, zygomatic arch, superior orbital rim and medial canthus (Fig. 2). Skin, fat and muscle were removed to expose viable tissue. Specimens taken at the time of surgery confirmed the diagnosis of necrotising fasciitis secondary to a haemolytic streptococcus. The microbiological culture grew a Group A *Streptococcus* sensitive to penicillin and erythromycin and her antibiotic treatment was altered accordingly.

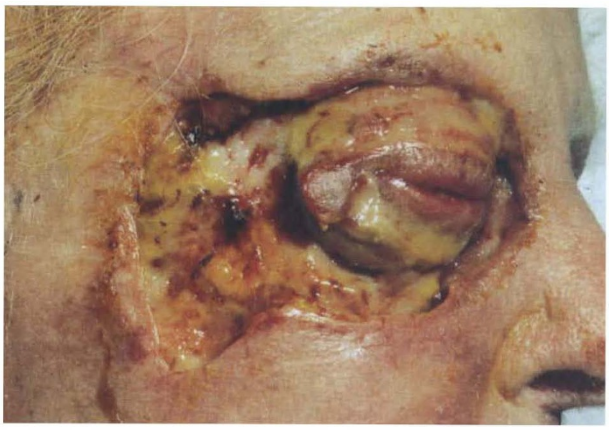

Fig. 2. *Photograph following the initial debridement. The necrotic tissue has been removed down to bone. The eyelid margins are spared.*

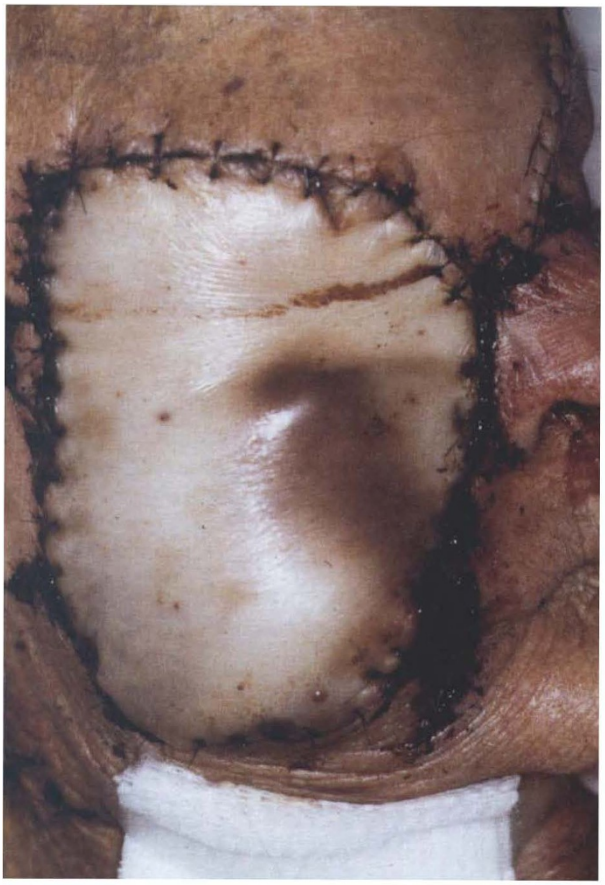

Fig. 3. *Photograph following right exenteration and insertion of a vascularised rectus abdominis muscle flap.*

However, the infection continued to spread, on to the face and forward to the angle of the mouth and there was extensive tissue necrosis extending deep into the orbit. Further surgery was performed by a multidisciplinary team. A more extensive debridement was performed with exenteration of the right orbit. A rectus abdominis free muscle flap was used to cover the deficit (Fig. 3). This flap failed to establish and 6 days later she underwent excision of the rectus abdominis flap, further debridement, and split skin grafting (Fig. 4). This graft established successfully and subsequently only a small wound dehiscence required excision and primary closure. Three months following her last operation the patient is at home and undergoing prosthetic rehabilitation.

Discussion

We believe that this is the first report of necrotising fasciitis occurring secondary to a botulinum toxin injection. Both eyes were treated at the same time and only one developed necrotising fasciitis; there was no evidence to suggest that the infection was caused by anything other than contamination from the patient's own skin. As has already been stated, necrotising fasciitis is usually restricted to subcutaneous fat and fascia. It might be speculated that in this case an innoculum of bacteria was introduced directly into the muscle at the time of botulinum toxin injection. Direct inoculation

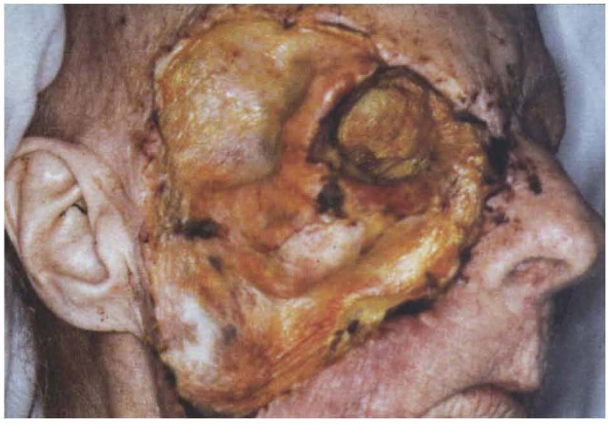

Fig. 4. *Photograph following debridement of the rectus abdominis flap and application of split skin graft. A small area of perforation is visible adjacent to the corner of the mouth, which was subsequently closed.*

allowed apparent extension through fascial planes and deep spread. This in turn caused difficulty in fully debriding the affected area.

Chronic debilitating processes such as diabetes, alcoholism and polymyositis have been suggested as predisposing factors in the development of necrotising fasciitis.[5] Chronic myeloid leukaemia itself does not make patients immunocompromised; however, the leucocyte count may become low as a result of treatment. In our patient the leucocyte count was 5.2×10^9/l, and therefore she may have had some element of immunosuppression,[6] as well as a chronic disease.

Necrotising fasciitis, although rare, needs to be considered in the differential diagnosis of soft tissue infections, thus facilitating early and appropriate surgical treatment. We would point out that injections in immunocompromised patients carry a rare but serious risk, and extra precautions should be taken, perhaps using a fully sterile field as in an operating theatre with gowns and masks.

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