Care of traumatic tattoos associated with gunpowder explosions and blast burns

A. M. BARUCHIN and S. SCHAF
The Barzilai Center, Ashkelon, Israel

Traumatic tattooing is the embedding of myriad particles driven deeply into the skin. The pigment granules will leave permanent dark blemishes if not removed immediately, and can cause tattoo deformities of such magnitude that the patient’s future life is gravely affected.

If the particles are not removed within the first days after injury, it becomes impossible to trace the path of individual particles into the depths of the dermis and no fully satisfactory treatment is available. This can be obviated by a relatively simple manoeuvre if tattooing is recognized and immediately treated at the time of injury, thus eliminating subsequent disfigurement and the necessity of additional surgical procedures with results that leave something to be desired (Figures 1–4).

Traumatic tattoos may be classified into abrasive and explosive types. The abrasive form (damage to the skin by friction, scraping or scratching following accidents such as falling on blacktop surfaces or cinder tracks and falling from vehicles) leaves pigment deposit in the more superficial layers of the skin. The explosive form (usually from a forceful impregnation of gunpowder associated with firearms, firecrackers, home-made bomb accidents, dynamite and industrial mining as well as military operations) often has a central focus of deeply embedded detritus with more superficially placed particles radiating from the central focus.

In the treatment of a patient with traumatic tattooing the management depends on three local factors: the blood supply, the integrity of the dermis and the presence of specialized dermis in the wound — for example, fingertip, nail bed, eyebrows, sole of the foot, vermilion and glans penis. After making an assessment of the patient’s general condition and the state of associated injuries, and after making a judgement based on balancing the three local factors listed above, the surgeon should elect to treat injury by one of the following methods:
CARE OF TRAUMATIC TATTOOS IN GUNPOWDER EXPLOSIONS

Figure 1. Close-up view of tattoo marks on the skin produced by a 7.62-mm blank cartridge during military training exercises

1. Debridement alone.
2. Debridement and excision of avulsed tissue with primary or secondary closure.
3. Debridement and excision of avulsed tissue with the use of the excised tissue as free graft.
4. Debridement and excision of avulsed tissue and the use of split-thickness skin graft.
5. Debridement and excision of the avulsed tissue and the use of pedicle flap.

However, the most basic technique is not difficult to apply and requires local anaesthesia, soap and water and at times a scrub brush, scalpel and forceps. There is no excuse for neglecting to apply it even in patients who have serious associated injuries. Early and thorough cleansing will reveal the presence of impregnated foreign material, which in many wounds can be removed without anaesthesia or, in the most complicated wounds, by infiltration of the dermis with weak local anaesthetic and then by scrubbing with a brush or by scraping with a knife. The wound should be dressed either with fine-mesh greased gauze or antibiotic ointment that is exposed to the atmosphere and which requires no further surgical care.

Agris (1976) recommended the use of a sterile hard natural-bristle toothbrush for the purpose, whereas Furnas and Somas (1976) use an operating microscope, high-powered loupes, very fine-toothed eye forceps and beaver 65 and 67 blades.