

A case of foreign body granuloma developing after gold thread acupuncture

Sir,

Acupuncture is a type of alternative Asian medical treatment used for musculoskeletal ailments therapeutically or for cosmetic purposes. Numerous adverse reactions have been reported as a result of acupuncture.

A 50-year-old Asian female came to dermatology outpatient clinic in Seoul St. Mary's Hospital with multiple asymptomatic

erythematous plaques on her face [Figures 1a and 1b]. Five months ago, she had developed ill-defined, 0.3–0.5 cm sized erythematous firm plaques on the forehead, left infraorbital area and both cheeks which increased in size during the past two months. The surface of the lesion was uneven. The patient had no underlying disease and was in good health; but had received gold thread acupuncture on her face six months prior for cosmetic purposes. She underwent X-rays of the skull and



Figure 1a: Multiple, erythematous, irregular shaped plaques on the forehead



Figure 1b: An erythematous, irregular-shaped plaque with yellowish dot on the cheek

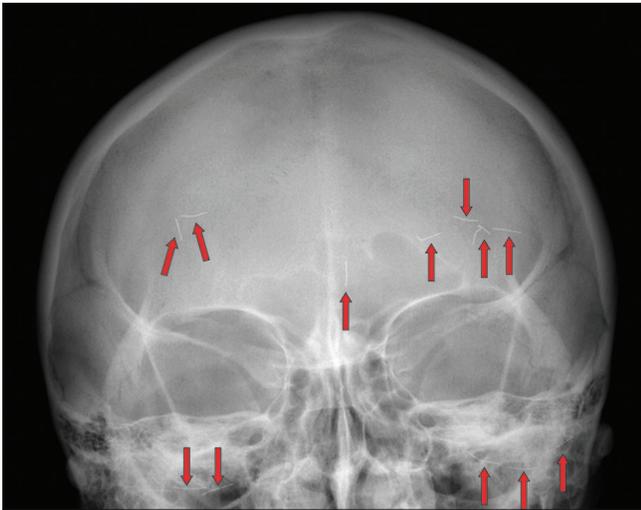


Figure 1c: Skull X-rays showed multiple diffuse radiopaque linear materials on the forehead, infraorbital area and cheeks

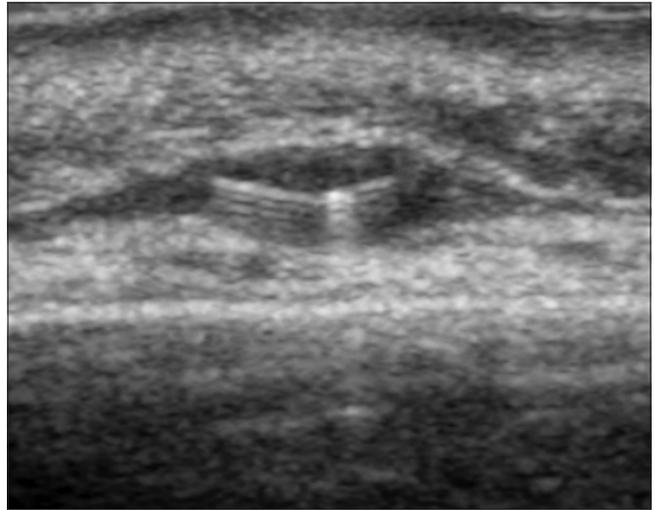


Figure 1d: Ultrasound showing multiple diffuse echogenic linear materials on the cheek

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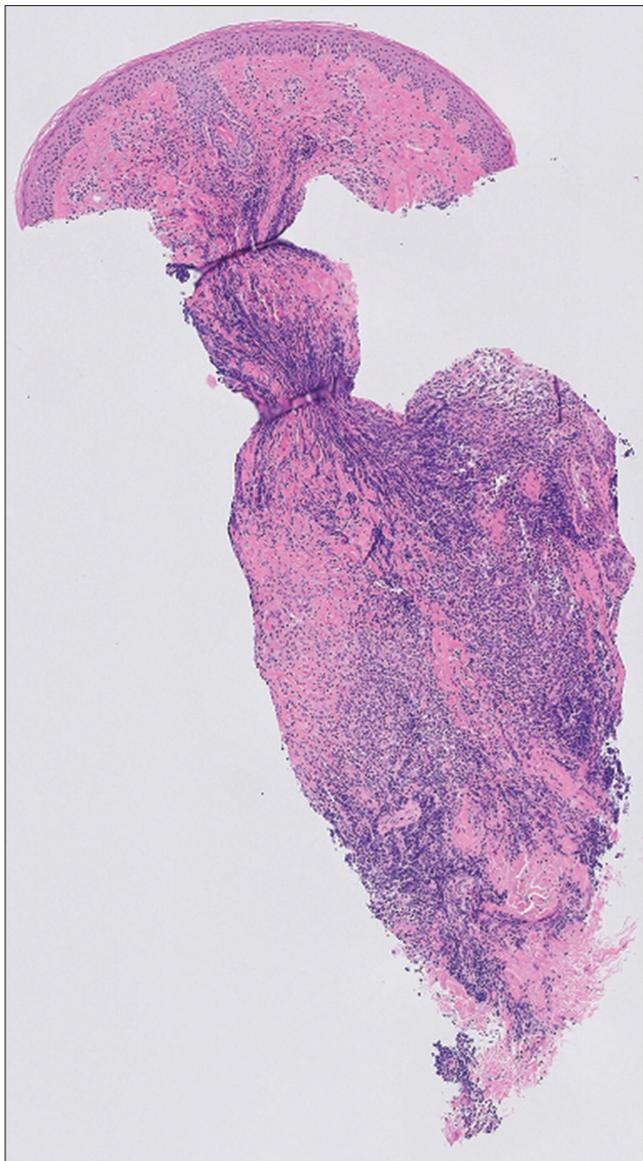


Figure 2a: Histological examination (H&E, ×40). Chronic granulomatous inflammation as diffuse infiltration of lymphocytes and histiocytes ranging from the superficial to deep dermis

ultrasound of the face. Multiple radiopaque and echogenic linear substances were observed on the sites corresponding to the skin lesions on both examinations [Figures 1c and 1d]. Pathologic findings showed chronic granulomatous inflammation with diffuse lymphohistiocytic infiltration of the superficial to deep dermis without necrosis [Figures 2a and 2b]. Metallic particles were not identified in the tissue specimen, but the thread was removed from the lesional site before the biopsy. The combined Ziehl–Neelsen and tuberculosis/non-tuberculous mycobacteria polymerase chain reaction tests showed negative results.

At follow-up, several gold threads were removed from the previous acupuncture sites [Figure 3]. After local anaesthesia, the gold thread was extracted using fine forceps and a sterile needle. However, the X-rays and sonographic findings

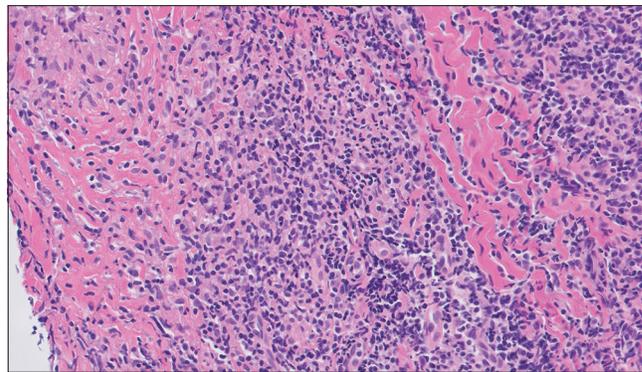


Figure 2b: Histological examination (H&E, ×200). Chronic granulomatous inflammation as diffuse infiltration of lymphocytes and histiocytes ranging from the superficial to deep dermis

indicated a large number of gold threads located in other areas. Intralesional injection was performed several times, and ten milligrams of oral prednisolone was prescribed for one week to reduce inflammation. Lesions showed slight improvement six months later but remained.

Acupuncture is a traditional Asian medical treatment and includes injection of bee venom, plant extracts, hyaluronic acid or other substances for primarily musculoskeletal therapeutic purposes. Although originating in Asia, acupuncture has been used internationally; 1.4% of adults reported using acupuncture over a one-year period in the United States.¹ Cases of gold thread acupuncture, a procedure with insertion of multiple, small pieces of sterile gold thread for painful joints, have been reported. Gold threads implanted at the acupuncture sites are hypothesised to function as a source of continuous stimulation and have been used for osteoarthritis and rheumatoid arthritis in Asian countries.² In the present case, the threads were used for a cosmetic procedure based on the belief that gold threads left in the skin promote regeneration of elastic tissues. Known adverse effects of acupuncture include foreign body granuloma, mycobacterial infection, cutaneous tuberculosis, pyoderma gangrenosum and factitial panniculitis. Park *et al.* reported 25 cases of adverse events with foreign body granuloma accounting for 20%.^{1,3}

Foreign body reaction is an inflammatory process against exogenous materials and foreign substances penetrating the skin, such as those used in tattoos or cosmetic implants or those occurring during trauma, which can cause cutaneous granulomatous reactions.⁴ The precise pathogenesis and mechanism of foreign body granulomas remain unclear⁵; and their formation is unpredictable, although their development has been associated with infection. In the present case, permanently inserted gold acupuncture needles caused diffuse inflammation and cutaneous reactions, though adverse chemical or immunologic tissue reactions are very unlikely with an inert implant material such as gold. However, even the most stable materials such as metal or synthetic materials,



Figure 3: Dermoscopy image of gold thread removed from the skin lesion (0.1 × 7 mm sized) [IDS-1100 (Illuco), ×10]

finally, are damaged under repetitive bending stress.⁶ As Stark and Bannasch reported, after implanting the gold thread suspension, not a single thread was found to be intact or in its original location.⁶ Furthermore, *in vivo* and *in vitro* studies have shown that metallic gold implants release gold ions in tissues as a result of interaction with oxidative agents, most likely released by macrophages.⁷ The trivalent gold ion is a reactive intermediate metabolite formed by *in vivo* oxidation of Au⁺, and it is the metabolite thought to have the strongest association with adverse reactions to gold salts.⁸ T-cell sensitisation to the Au³⁺ ion itself generates adverse immune reactions and Au³⁺ possibly reacts with lysosomal proteins sensitising T cells.⁸ In mice, gold-induced autoimmunity is probably T-cell dependent, but the underlying mechanism has not been established.^{9,10} Since gold thread acupuncture is often used for muscle pain or arthralgia, cases of gold thread in articular area² or causing cellulitis in distal body portion¹¹ had been reported. Herein, we were able to observe the skin reaction induced by the gold thread injected into the dermis for cosmetic purposes, and the granulomatous reaction was improved by gold thread removal and intralesional injection.

Although treatment can be difficult and in many cases unsuccessful, intralesional corticosteroid injection could be a relatively effective treatment method, as long as infections are avoided.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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