Systemic lupus erythematosus induced by adjuvants after metal-on-polyethylene total hip arthroplasty

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To the Editor: Autoimmune/autoinflammatory syndrome induced by adjuvants (ASIA, Shoenfeld syndrome) has recently been described. Herein, we report a patient with immunoregulatory dysfunction and systemic lupus erythematosis (SLE) after total hip arthroplasty (THA).

A 36-year-old Chinese woman underwent implantation of a metal hip prosthesis, the acetabular component consisting of a dome composed of an alloy of titanium, cobalt, and molybdenum fitted with an ultra-high molecular weight polyethylene liner (batch number: 10010133T; Suzhou Xinrong Medical, Suzhou, China). The pre-operative diagnosis was hip osteoarthritis [Figure 1A and 1B]. Eight months after the surgery she developed myalgia with pain in the right thigh that was controlled by oral non-steroidal anti-inflammatory drugs for 1 week. Two months later, she developed a rash over her whole body accompanied by fever of 38°C, which was controlled in a week by treatment with dexamethasone. The patient then developed slight dryness of the mouth, thirst, fatigue, anorexia, and right upper abdominal discomfort. Gastritis was diagnosed, for which she was prescribed omeprazole daily for the next 18 months. Blood tests showed increase in the erythrocyte sedimentation rate and neutropenia. Thirty months after her hip replacement, she was treated as having Felty syndrome (rheumatoid arthritis, splenomegaly, and neutropenia) by the endocrinology department. She developed painful ulceration in the scar over her right hip. Culture of specimens from the scar ulcers were negative and no cause of the ulceration had been identified by 40 months after the hip replacement. The ulcer recurred intermittently for 16 months. Radiographs revealed no evidence of osteolysis or implantation failure. 99mTc-methylenediphosphonate-labeled triphase isotope scintigraphy and bacterial culture excluded infection. Pathological findings of material obtained by debridement are shown in Figure 1C and 1D. She was diagnosed with SLE 60 months after implantation, when she developed a typical "butterfly rash" and antibody testing revealed high titers of anti-Ro/SS-A (+), anti-La/SS-B (+), and anti-nuclear antibody test by indirect immunofluorescence on human epidermoid carcinoma cell line HEp2(+)(1:1000), with lymphocytopenia and neutropenia. A new cemented prosthesis was substituted for the titanium alloy 66 months after the first surgery. Nine months later, all the above abnormalities had resolved. The final diagnosis was an inflammatory mass related to adjuvants.

Failure of artificial joint replacement is generally associated with osteolysis, infection, repeated dislocation, or fracture. However, metal prostheses can cause metal allergies.[1] Some scholars have recently proposed an ASIA.[2] Our patient was diagnosed as having SLE; whether this was caused by adjuvants remains unclear. Titanium-molybdenum alloy allergy is reportedly associated with development of SLE.[3] Conventional serological, imaging, and laboratory diagnostic methods were used to check for periprosthetic infection. 99Tcm triple-phase bone scanning and intra-operative neutrophil count by frozen section analysis was performed, but the results were negative. Metal allergy may contribute to the multifactorial pathogenesis of implant failures. Metal-induced inflammation may be an important risk factor in metal-allergic patients.[4]

In conclusion, immune disorder is a serious complication of THA. Metal hypersensitivity associated with hip or knee arthroplasty may lead to and exacerbate SLE.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the article. The patient understands that her name and initials will not be published and due efforts will be made to conceal the identity of the patient, although anonymity cannot be guaranteed.

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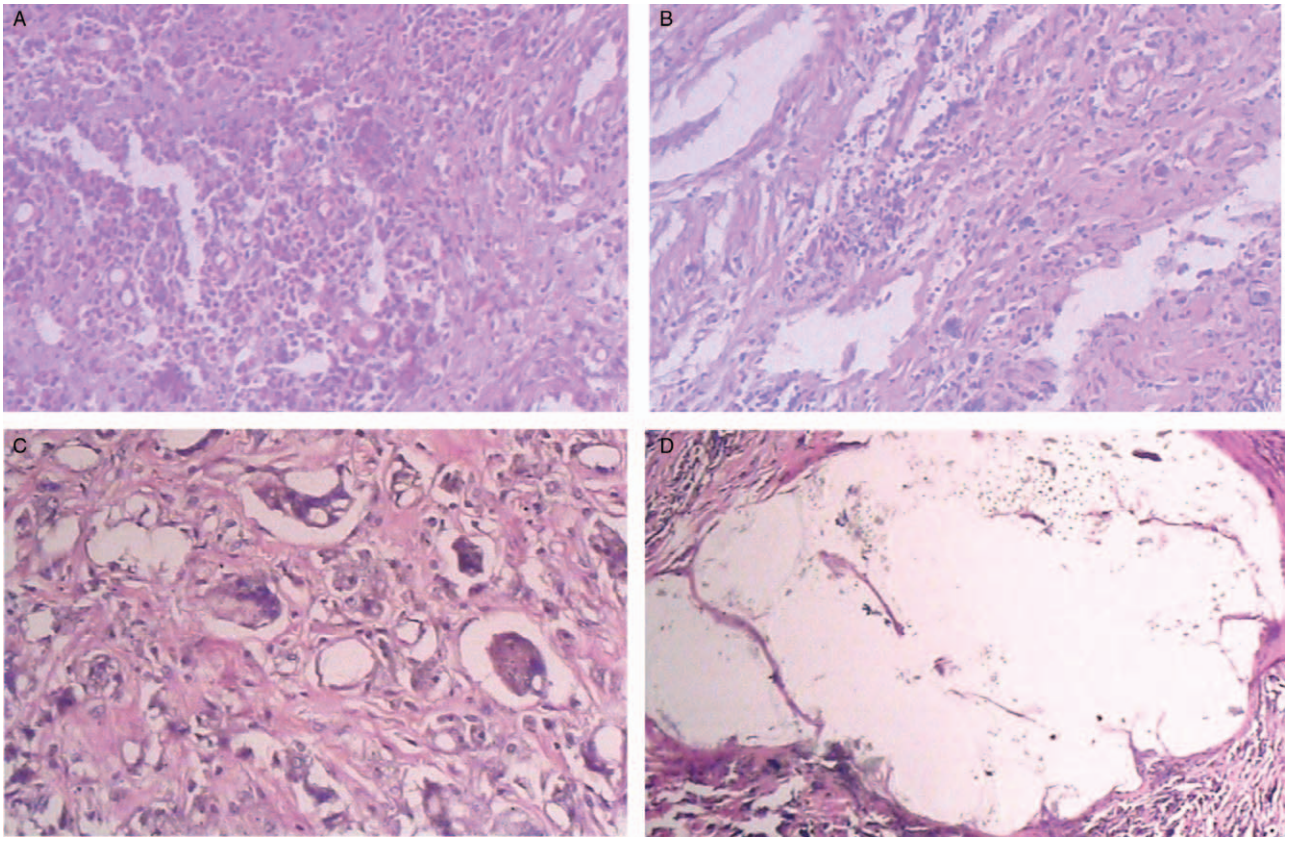

Figure 1: The pathological findings of a 36-year-old female patient with hip osteoarthritis via a posterolateral approach for right hip. Hip osteoarthritis and femoral head necrosis (A and B, Hematoxylin-eosin staining, original magnification ×100). T lymphocytes with chronic inflammation and fibrous tissue hyperplasia (C and D, immunohistochemical staining, original magnification ×100).

Conflicts of interest

None.

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