Application of radioisotope synovectomy in the ankle joint in a child with congenital factor VII deficiency

Konjenital FVII eksikliği olan çocukta ayak bileğine radyoizotop sinovektomi uygulaması

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Dear Editor,

Congenital factor VII (FVII) deficiency is a rare bleeding disorder inherited autosomal recessively (1, 2). It is the most common congenital rare factor deficiency in the world. The clinical picture is variable; it may be asymptomatic or may lead to critical bleeding (3). There is a weak correlation between FVII activity and clinical findings (1, 4). Mucocutaneous bleeding is observed predominantly. Bleeding such as hematoma and hemarthrosis occur rarely compared to patients with haemophilia (1, 3, 4). The clinical picture and follow-up of patients who present with hemarthrosis is similiar to patients with haemophilia. Development of a target joint and subsequent chronic synovitis and arthropathy may be observed. Use of radioisotope synovectomy (RS), which is known to have successful outcomes in patients with haemophilia with secondary prophylaxis and surgical interventions, is limited in patients with FVII deficiency. Here, we share our experience of radioisotope synovectomy in the ankle joint in a patient with congenital FVII deficiency who developed a target joint and chronic synovitis.

A 4-year-old female patient presented to our hospital's pediatric outpatient clinic with symptoms of intermittent swelling and pain in her joints. She had been followed up in different hospitals with a prediagnosis of rheumatic disease. She had no family history of consanguineous marriage. On physical examination, she had edema, erythema, and pain in the right ankle. Laboratory tests revealed a prolonged prothrombin time (PT) and normal activated partial thromboplastin time (aPTT). FVII activity was 0.1%. For treatment, 4 doses of rFVIIa were used with 4–6-hour intervals at a dose of 20 mcg/kg. After the patient was discharged, gingival bleeding and haemorrhage in her joints, especially her right ankle, and to a lesser extent, her left knee and left ankle, were observed on follow-up. In the treatment of the bleeding episodes, rFVIIa was used at a dose of 20 mcg/kg at 4–6-hour intervals. Factor concentrates were administered via peripheral veins. We obtained a good response to the bleeding episodes. Secondary prophylaxis with rFVIIa was initiated due to approximately 1–2 bleedings/month in her right ankle and target joint in the preceding 6 months. The patient was evaluated at the multidisciplinary haemophilia council. Right ankle magnetic resonance imaging revealed grade II synovitis and effusion, and it was decided to perform radioisotope synovectomy because a target joint was present. Radioisotope synovectomy was performed in the patient's right ankle by the orthopedist and nuclear medicine specialist using fluoroscopy under anaesthesia and hygienic conditions with sterile materials. Two millilitres Re-186-sulphur colloid was used at a dose of 74 MBq (2 mCi) for radioisotope synovectomy. Following radionuclide injection, a small volume of 0.9% saline solution was administered into the joint space for cleaning before removing the needle. Just after the procedure, immobilisation of the joint for 72 hours was recommended. Post-distribution scintigraphy was performed to check if there was radionuclide leakage outside the joint. rFVIIa replacement at a dose of 20 μg/kg was performed as one dose before the procedure, followed by six doses at 4-hour intervals on the first day after the procedure, four doses at 6-hour intervals on the second day, and as two doses at 12-hour intervals on the third and fourth days. Subsequently, rFVIIa prophylaxis was continued every day in the first week, and three days per week in subsequent weeks. During the 1-year follow-up period after radioisotope synovectomy, no bleeding in the ankle was observed. No allergic and thrombotic adverse effects were found. The patient is still followed up with rFVIIa prophylaxis.

Fibrinogen, prothrombin (FII), FV, FVII, FVIII, FIX, FX, FXI, and FXIII deficiencies are rare factor deficiencies. Bleeding episodes may range from mild to severe in patients with rare factor deficiencies. (3). The most typical symptom is mucosal bleeding which is typical to all rare bleeding disorders. Hemophilia A (FVIII deficiency) and haemophilia B (FIX deficiency) are the most common congenital bleeding disorders. According to the World Federation of Hemophilia 2018 data, 201 454 of 337 641 patients with congenital bleeding disorders had haemophilia A and B (62%) (5). In our country, 5738 (63%) of a total of 9147 patients have haemophilia A and B (5). In patients with haemophilia A and B, muscle and joint bleeding are observed most frequently. Prophylaxis given with specific factor concentrates to prevent joint bleeding in patients with haemophilia is the gold standard in the treatment. Joints that bleed three times or more in a 6-month period despite prophylaxis are called target joints, and this leads to the development of chronic hemophilic arthropathy. Chronic synovitis should be considered when frequently recurring bleeding cannot be controlled and persist. There are radioisotopic (Rhenium 186 or Yttrium 90), arthroscopic or surgical synovectomy options for patients who develop chronic synovitis and target joints (6). These treatment options require experienced teams and intensive factor use. Among radioisotopic options, Yttrium 90 is mostly recommended for knees, and Rhenium 186 is recommended for elbows, ankles, and shoulder joints (7). Although joint bleeding in cases of FVII deficiency has been reported, there is a limited number of data related to clinical follow-up, frequency of chronic synovitis and arthropathy, and treatment in these patients (8). We believe that radioisotope synovectomy is a treatment option that yields favourable outcomes in patients with FVII deficiency who have target joints and chronic synovitis, even though its use has been reported in a limited number of patients.

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