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Pseudoaneurysm of the popliteal artery in a child: an unusual complication of reconstruction of traumatic tibial fracture using Kirschner wire

Çocuk hastada popliteal arterde yalancı anevrizma: Travmatik tibial kırık rekonstrüksiyonunda kullanılan Kirshner çivisinin alışılmadık bir komplikasyonu

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Kirschner pins are being increasingly used by orthopedic surgeons in the treatment of skeletal fractures after severe bodily injuries. As a result, there have been reports in the literature about the various complications caused by the Kirschner pin, such as wound laceration or hematoma. However, to our knowledge, pseudoaneurysm of the popliteal artery due to Kirschner pin in the late postoperative period has not been reported previously in the English literature. Herein, we present a child with pseudoaneurysm of the popliteal artery after reconstruction of a tibia fracture using Kirschner pin insertion.

Key Words: Kirschner pin; popliteal artery; pseudoaneurysm; trauma.

Ciddi vücut travmalarından sonra gelişen iskelet kırıklarının tedavilerinde genel olarak Kirschner çivileri ortopedik cerrahlar tarafından giderek artan biçimde kullanılmaktadır. Kirschner (K) çivisine bağlı olarak yara yerinde hematom veya dokularda yırtık gibi değişik komplikasyonlar literatürde bildirilmiştir. Ancak, bildiğimiz kadarıyla K-çivisine bağlı olarak popliteal arterde yalancı anevrizma gelişimi İngilizce literatürde daha önce bildirilmemiştir. Bu yazıda, K-çivisi yerleştirildikten sonraki geç dönemde popliteal arterde yalancı anevrizma gelişen bir çocuk hasta sunuldu.

Anahtar Sözcükler: Kirschner çivisi; popliteal arter; yalancı anevrizma; travma.

CASE REPORT

A five-year-old child presented with an enlarging pulsatile mass in his left popliteal fossa. He had presented six months before to another institution with multiple osteal fractures of the lower extremity due to falling, including left tibial fractures that required a Kirschner wire (KW) insertion. The device had been inserted around the left knee for the treatment of tibial fracture (Fig. 1). He had experienced sharp pains in his leg and demanded that the KW be removed. The pain did not subside after this treatment, and his family did notice the pulsatile mass in his left leg at that time. Four months before presentation to our institution, the patient had felt a sudden pain and experienced swelling in his left leg. On physical examination, the patient was afebrile and hemodynamically stable. Locally, a 5x7 cm nontender pulsatile mass was recorded in the medial aspect of the lower left popliteal area. The distal pulses were patent. Magnetic resonance imaging revealed a 5x6x8 cm heterogeneous mass along the left popliteal artery (Fig. 2). Because the artery fed distal runoff vessels, computed tomography angiography was also performed, and a localized pseudoaneurysm was found, with medial displacement of the left popliteal artery and adequate distal runoff (Fig. 3).

Open surgery using a medial approach to the popliteal artery aneurysm was done. The distal popliteal artery was clearly exposed. After systemic heparinization, the proximal and distal popliteal artery was clamped and the aneurysm sac was opened longitudinally. A large volume of hematoma was evacuated. End-to-end popliteal artery anastomosis using a 7/0 polypropylene suture was performed. The patient's postoperative course was uneventful, and he was discharged home on the 5th postoperative day. Upon discharge, the patient had palpable equal distal runoff in lower extremities.

DISCUSSION

Pediatric vascular trauma is a severe clinical condition, accounting for about 1% of pediatric trauma admissions in one multicenter experience.[1] The upper

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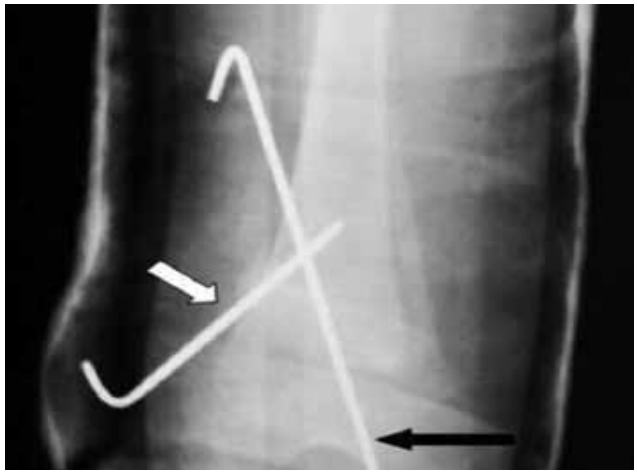

Fig. 1. Direct X-ray illustrating the anatomic correlation between the popliteal artery and the K-wires (arrowheads).

extremity vascular injury in rarely related to iatrogenic factors.[2,3] Lower extremity arterial injury accounts for 30% of the reported pediatric vascular trauma cases.[1]

This clinical condition has rarely been reported, and different etiologic mechanisms such as blunt or penetrating trauma have been suggested previously. It may develop after arterial reconstructive surgery, diagnostic procedures and perigenicular neoplasia. To our knowledge, this is the first report of popliteal artery pseudoaneurysm caused by KW in a pediatric case. Popliteal artery pseudoaneurysms after orthopedic surgery are not uncommon. Hussein et al.[4] reported an adult case after arthroscopic meniscectomy in 1998 and O'Connor and colleagues[5] reported a case following total knee arthroplasty.

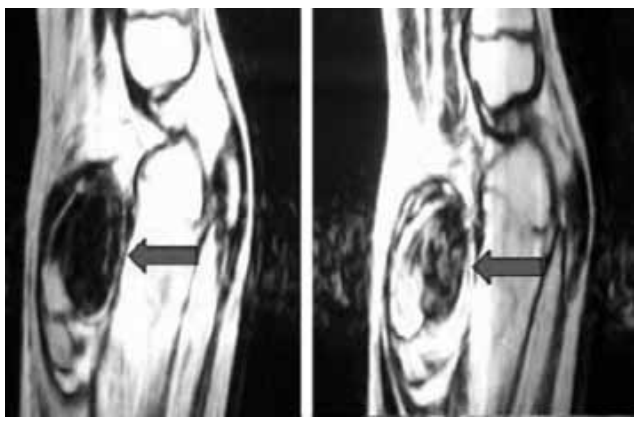

Fig. 2. Magnetic resonance imaging of the aneurysm of the left popliteal artery. Huge pseudoaneurysmal sac and smooth and thick wall in the left thigh are seen.

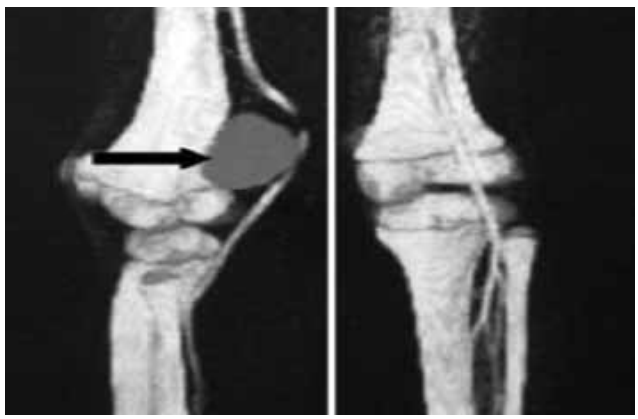

Fig. 3. Saccular aneurysm of the left popliteal artery (diameter 5 cm) in the left popliteal area. Adequate runoff of the distal artery is clearly shown on computed tomography angiography.

When the diagnosis is delayed, the patient may present with severe complication such as rupture, infection or distal embolization. However, many of these injuries are initially subclinical and remain undetected, as in our presented case.

The KW is increasingly being used among orthopedic surgeons for the fixation of skeletal fractures and reconstruction of bones after accidents. Adverse effects related to the device insertion have rarely been reported, but are notable. A rate of complications of 15.2% was reported by Stahl et al.[6] among their 236 patients and included osteomyelitis, tendon rupture, nerve lesion, pin tract infection, pin loosening, and pin migration.

In our described case, the needle presumably penetrated the medial wall of the artery, which led to extravasation around the artery, and the initial bleeding was arrested by the surrounding tissue. Eventually, rupture was subsequently precipitated by leg motion. We conclude that KW injury was the most likely cause of the popliteal artery pseudoaneurysm since on direct X-ray it appeared that the KW insertion was anatomically localized adjacent to the popliteal artery. Surgeons should be aware of possible adverse effects due to the device, such as popliteal artery pseudoaneurysm, if a pulsatile mass develops in the surgical area.

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