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Life saving surgery for ruptured pseudo aneurysm of external iliac artery: case report

Cirurgia para salvamento de vida após ruptura de pseudoaneurisma da artéria ilíaca: relato de caso

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Abstract

The incidence of pseudo aneurysm after total hip arthroplasty is extremely rare. The most common mechanism of vascular injury is due to direct trauma during the operative procedure, and the most reported cases are acute in presentation. We reported an unusual case of ruptured pseudo aneurysm and control of life-threatening intra-operative hemorrhage of the external iliac artery in a male patient, 68 years old, with displaced total hip arthroplasty (THA), planned for removal, occurring 2 years after the last hip surgery, in Armed Forces hospital, Southern region, Saudi Arabia. This case highlights the importance of prompt recognition of life-threatening intra-operative hemorrhage to save the patient's life and the limb.

Keywords: Aneurysm, false; arthroplasty; hemorrhage.

Resumo

A incidência de pseudoaneurisma após a artroplastia total de quadril é extremamente rara. O mecanismo mais comum de lesão vascular deve-se ao trauma direto durante o procedimento cirúrgico, e os casos mais relatados são de apresentação aguda. Relatamos um caso incomum de ruptura de pseudoaneurisma e controle de hemorragia intraoperatória com risco de morte da artéria ilíaca externa em um paciente do sexo masculino, de 68 anos, com artroplastia total do quadril deslocada, planejada para remoção, ocorrendo 2 anos depois da última cirurgia de quadril, no Hospital das Forças Armadas, região sul da Arábia Saudita. Este caso destaca a importância do pronto reconhecimento da hemorragia intraoperatória com risco de morte para salvar a vida e o membro do paciente.

Palavras-chave: Falso aneurisma; artroplastia; hemorragia.

Introdução

Vascular injury secondary to hip surgery is uncommon in that the reported incidence of major vascular injury after surgical procedures on the hip is only 0.25%[1]. The development of a pseudo aneurysm after total hip arthroplasty (THA) is an extremely rare complication. Most reported cases are acute in onset and are usually due to direct trauma during the operative procedure[1]. We reported an unusual case of ruptured pseudo aneurysm and control of life-threatening intra-operative hemorrhage of the external iliac artery in a patient with displaced THA, planned for removal, occurring two years after the last hip surgery.

Case report

A 68-year-old Saudi male patient was admitted for removal of infected total right hip replacement (THR), which was revised in 2000. A chronic hip sinus has developed following the revision surgery with continuous oozing, which, on occasions, was bloody. However, the culture swabs from the exudates were negative. Gradually, symptoms of pain and decreased hip motion have developed. He noticed right leg swelling prior to his admission to our hospital. He had other systemic medical diseases (diabetes mellitus and hypertension). During examination, he had normal temperature and non-pitting edema in the right leg. Distal pulses were present

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and there were no palpable swellings or bruit in the groin. Blood tests showed 9.5 g/dL of hemoglobin, white blood cell count of 7.7/mm and a normal coagulation screen. A radiograph of the right hip showed pelvic bone with displacement of the prosthesis out of its cup into the medial pelvis (Figure 1). Doppler ultrasound scan of the right leg showed expanded, non-compressible femoral vein, suggestive of deep venous thrombosis (DVT). The venogram confirmed iliofemoral DVT. A retrievable inferior vena cava filter was inserted (Figure 2). The patient was started on low molecular heparin prior to the removal of the THR. Through a standard lateral approach and after opening the wound and the trail to take out the prosthetic femur from its socket in the acetabulum, uncontrollable bleeding was encountered. Immediate control of hemorrhage was achieved by packing. In the meantime, the vascular surgeon was contacted and transfusion of blood was started.

Figure 1 – Right total hip arthroplasty displaced.

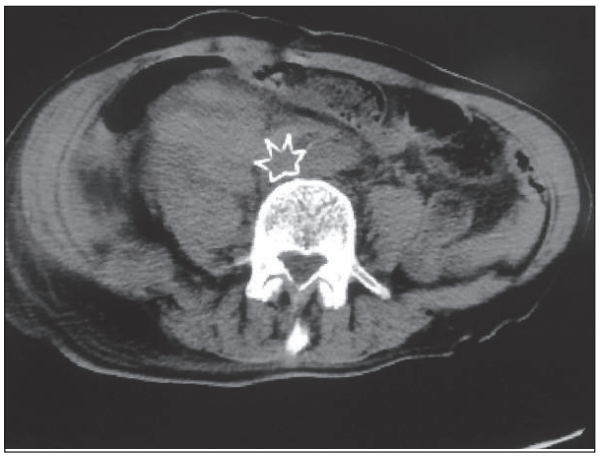

Figure 2 – Computerized tomography with contrast showing inferior vena cava filter.

Bleeding was noticed from behind the acetabular prosthetic cup. A Foley's urinary catheter (size 16) was inflated behind the cup and surrounded by gauze packs. The pressure and the pulse rate began to improve and the patient became controlled. The orthopedic surgeons started to take out the femoral prosthesis, which was toughly adhered to its surrounding. Infra-inguinal exploration of the proximal part of the common femoral artery and a retroperitoneal exploration of the right external iliac artery were carried out. No apparent bleeding was seen. The clamping of the external iliac artery was carried out and the acetabular cup was removed from the acetabular space. A false capsule and granulation tissues were seen avulsed from the surroundings. After dissecting circumferentially the external iliac artery and the proximal part of the right common femoral artery, a posterior wall rounded hole was seen. After examining it and the lumen of the artery, there was an intimal dissection with old subintimal dissection of 10-20 mm proximal and distal to the arterial hole. An interposition of 6 mm Dacron graft was carried out by the use of 5/0 no absorbable prolene stitches for anastomosis.

The pulse regained palpable at the right posterior tibial and dorsalis pedis arteries. The patient's postoperative course was uneventful until the fifth postoperative day. The patient started to complain of lower abdominal pain. Abdominal and pelvic ultrasonography was carried out, which revealed massive retroperitoneal hematoma. Patient's hemodynamics and hemoglobin level did not change. Computerized tomography with contrast showed a big retroperitoneal hematoma communicating with the lateral wound of the removed prosthesis (Figure 3). The graft was intact and no signs of abnormality were seen associated

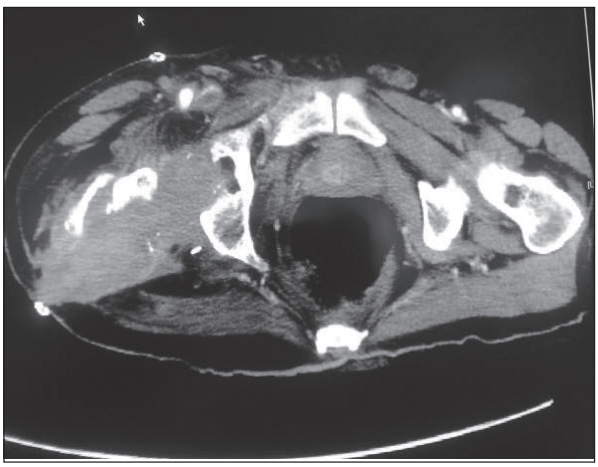

Figure 3 – CTA. Right hip hematoma.

with it (Figure 4). The patient was observed for two weeks until the skin stapler clips were removed. The follow-up was carried out monthly for over six months. The right pedal pulses were well palpable and there were no signs of graft infection or thrombosis.

Discussion

Vascular complications associated with THA are remarkably rare, making diagnosis and treatment of such sequelae extremely challenging for surgeons who are not familiar with their management (as evidenced by the high rate of limb loss, 70%). Pseudo aneurysms are usually asymptomatic and detected incidentally during surgery or radiographic study, unless infection, local compression on neurovascular structures or rupture occur[1]. The common causes of pseudo aneurysms include trauma, tumor, infection, vasculitis and inflammation, atherosclerosis, infarction, and various iatrogenic complications, such as those from surgery and angiography[2]. The mechanism of vascular injury, in most cases, are due to direct trauma during the operative procedure, such as perforation of vessels by retractors, osteotomes, powered reamers, screws, cement or even maneuvers to dislocate hip[1].

Injuries causing delayed symptoms are of three types and give rise to symptoms appearing between a few days and several years after the operation:

a) pain in the hip caused by pressure of a pseudo aneurysm;
b) ischemic symptoms in the affected limb due to impaired blood flow or distal microembolization;
c) severe hemorrhage when extracting a hip prosthesis.

The etiology is either a too large volume of cement with intrapelvic spiculae causing thermal damage or erosion of the artery or an intrapelvic dislocation of the socket with pressure and angulations of the artery[3].

Unlike most reported cases, our patient did not developed symptoms of pseudo aneurysm since his last surgery. The sequence of the most likely events began with the screw in the acetablar cup at the time of the last surgery, two years ago. The patient developed iliofemoral DVT from the compression of the external iliac artery pseudo aneurysm.

Rengsen et al.[1] reported an injury to the external iliac artery from an acetablar cup, which resulted in formation of a pseudo aneurysm. They believed that the threaded acetablar cup with sharp cutting flutes might have caused

Figure 4 – Right external iliac artery grafted.

direct lesion of the arterial wall. Although the acetablar component used in this patient did not have sharp cutting flutes, we believe that the arterial lesions might have been similarly caused by repetitive direct trauma from either the acetablar cup or the implanted femoral head.

Rupture of pseudo aneurysms of iliac artery usually demands immediate surgical repair, but surgery involves high mortality and morbidity risks, especially for debilitated patients in the emergency setting[4]. In managing these aneurysms, there is a very high perioperative mortality rate (33 to 50% in emergency surgery; 7 to 11% in elective procedures)[5,6]. A systematic, planned operative approach is necessary to reduce morbidity and mortality.

Conclusion

Rupture of pseudo aneurysms of iliac artery usually demands immediate surgical repair. Awareness of this rare complication, prompt diagnosis and immediate treatment are key factors in saving the lives of such patients.

This case demonstrated that a pseudo aneurysm can manifest as an acute presentation secondary to direct injury during a surgical procedure. It can appear late and be caused by repetitive trauma from arthroplasty components. If a pseudo aneurysm is suspected, an angiogram should be performed, followed by appropriate treatment as soon as possible.

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