



## Intraoperative arterial occlusion in total hip arthroplasty A report of two cases

Jean-Pierre SIMON, Antoon VAN RAEBROECKX, Johan BELLEMANS

*From the University Hospital Pellenberg, Pellenberg (Leuven), Belgium*

**Limb threatening arterial occlusion during total hip or knee arthroplasty is an uncommon complication. The authors present two cases of thrombosis of the common femoral artery that occurred following and during total hip arthroplasty respectively. Acute thrombectomy was performed in both patients within 3-4 hours after the diagnosis. Both patients permanently kept some numbness over the foot and slight weakness in the extensors. With a delayed diagnosis such lesion may have lead to the loss of their limb. This underlines the absolute need for regular control of the arterial supply, sensory and motor conditions following joint arthroplasty during the first 24 hours following surgery.**

**Keywords :** arterial thrombosis ; total hip arthroplasty.

### INTRODUCTION

Vascular complications during or following arthroplasty of the lower limb are rare. Complications involve ischaemia, bleeding, pseudoaneurysm, ischaemia plus bleeding and venous thrombosis. Venous thrombosis is by far the most common complication. Arterial occlusion is a rare complication and may be seen acutely or during the weeks following surgery.

### CASE 1

A 74-year-old man with a history of cardiovascular disease received a total hip replacement,

under general anaesthesia, through a posterolateral approach. Twelve hours before surgery 40 milligrams of enoxaparin was administered to prevent deep venous thrombosis. The operation was straightforward. Twenty-four hours later the operated leg was pale, very painful and pulses were absent. There was numbness over the lower leg and nearly complete loss of ankle dorsiflexion. Urgent thrombectomy of the common femoral artery was performed. There was a good recovery, but some numbness remained over the dorsum of the foot and front of the lower leg, as well as slight weakness of the foot extensors.

### CASE 2

A 66-year-old lady was admitted for severe arthritis of the right hip. Preoperative physical

- 
- Jean-Pierre Simon, MD, PhD, Professor of Orthopaedics.
  - Antoon Van Raebroekx, MD, Orthopaedic Surgeon.
  - Johan Bellemans, MD, PhD, Professor of Orthopaedics.

*Department of Orthopaedic Surgery, U.Z. Pellenberg (Leuven), Belgium.*

Correspondence : Jean-Pierre Simon, University Hospital Pellenberg, Weligerveld 1, 3212 Pellenberg, Belgium.

E-mail : Jean-Pierre.Simon@uz.kuleuven.ac.be.

© 2007, Acta Orthopædica Belgica.

---

examination did not show any increased operative risks. The patient was a non-smoker, non-diabetic, did not take any medication, had no peripheral vascular disease and had normal pulsations. She had never been operated before. Forty milligram of enoxaparin was given 12 hours before surgery. A routine total hip replacement was performed under general anaesthesia through a posterolateral approach in the lateral decubitus. Immediately after extubation the patient complained of excruciating pain and numbness in the operated leg and could not move her foot. Clinically the leg was livid and there were no distal pulses and no capillary refill. An urgently performed arteriogram showed a complete block in the femoral artery. The patient then had an urgent open thrombectomy. A thrombus which extended from the superficial femoral artery distally into the popliteal artery and the posterior tibial artery was removed. In the recovery room the patient could move the foot again and the pain had disappeared. Paraesthesiae in the foot resolved gradually in the following weeks but she permanently kept a numb patch over the dorsum of the foot and minimal weakness of the ankle dorsiflexors. Diagnostic work up at the centre for haematology and vascular diseases did not show any abnormality in her coagulation mechanism.

## DISCUSSION

Arterial lesions following hip and knee arthroplasty are unusual injuries (1-7). A large review by Calligaro *et al* of more than 23000 hip and knee arthroplasties (including primary and revision cases) revealed an incidence of 0.17% in total knee arthroplasty and 0.08% in total hip replacement (2). This review included all arterial problems making it reasonable to assume that arterial thrombosis is even more exceptional.

Between June 1990 and the end of May 2007 the senior author operated 2432 patients. One-hundred and forty-eight of these had a single stage bilateral total hip arthroplasty. Only the two above mentioned patients developed an arterial thrombosis, giving an incidence of 0.08% up to this moment. In the literature this problem is only mentioned

as case reports (1, 3-6). One case of a thrombosis of an aortobifemoral bypass graft after total hip arthroplasty has also been reported (7).

Various hypotheses which possibly contribute to arterial obstruction are described in literature. Overextension of atherosclerotic arteries with subsequent tear of the intima and thrombus formation is a possible mechanism especially important during femoral exposure in the lateral decubitus (6). Thrombotic occlusion due to the intense heat of cement polymerization has also been suggested (5). Not surprisingly smoking and peripheral vascular disease are held responsible as well (4).

The most commonly involved vessels are the external iliac artery and the common femoral artery. Intraoperative occlusion of the femoral artery during hip arthroplasty (case 2) in healthy patients has not been reported before. The cause of the acute thrombosis in our case remains unknown. Parfenchuck and Young reported one case of an intraoperative occlusion but their patient had a preexisting high risk because of the presence of an aortoiliac graft for an abdominal aortic aneurysm (4). The case described above demonstrates that vascular occlusion may occur during THA without any demonstrable preexisting symptoms or signs. All cases in literature report the thrombosis to occur during the first 24 hours up to several weeks after surgery. We think that this observation, especially during the first 24 hours is related with a delayed diagnosis rather than indicating the actual moment of clot formation. One of the most alarming findings in the review by Calligaro *et al* (mentioned above) is the fact that in about half of the patients (44%) the arterial injuries were not recognized on the day of surgery (2). Yet delay of the diagnosis may lead to irreversible lesions due to development of a compartment syndrome (1) or even to amputation of the limb (3).

With this presentation we again would like to emphasize the importance of pre- and immediate postoperative control of arterial pulses and neurological signs, not only in patients with risk factors but in every patient admitted for hip surgery. Routine vascular control will avoid any delay in vascular treatment if necessary and reduce the risk of long term serious complications.

## REFERENCES

1. **Bellemans J, Stockx L, Peerlinck K, Vermeylen J, Lacroix H, Suy R.** Arterial occlusion and thrombus aspiration after total knee arthroplasty. *Clin Orthop* 1999 ; 366 : 164-168.
2. **Calligaro KD, Dougherty MJ, Ryan S, Booth RE.** Acute arterial complications associated with total hip and knee arthroplasty. *J Vasc Surg* 2003 ; 38 : 1170-1177.
3. **Heyes FL, Aukland A.** Occlusion of the common femoral artery complicating total hip arthroplasty. *J Bone Joint Surg* 1985 ; 67-B : 533-535.
4. **Parfenchuck TA, Young TR.** Intraoperative arterial occlusion in total joint arthroplasty. *J Arthroplasty* 1994 ; 9 : 217-220.
5. **Rutsaert R, Van Schil P, Martens C, Vaneerdeweg W, Schoofs E.** Occlusion of the left femoral artery after total hip replacement. Report of a case and review of the literature. *J Cardiovasc Surg* 1988 ; 29 : 216-218.
6. **Schöllner D, Kraseman PH.** [Acute occlusion of the iliac arteries after replacement of a total hip] (in German) *Arch Orthop Unfallchir* 1975 ; 22 : 305-308.
7. **Trousdale RT, Donnelly RS, Hallett JW.** Thrombosis of an aortofemoral bypass graft after total hip arthroplasty. *J Arthroplasty* 1999 ; 14 : 386-390.