

Case Report

Compartment Syndrome of the Buttock Following a Total Hip Arthroplasty

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Abstract: An elevation of the interstitial pressure in a closed osseofascial compartment results in compartment syndrome. This may be caused by a decrease in compartment volume or an increase in compartment contents. The gluteal compartment syndrome is rare. Because the gluteal region has a large volume, this compartment requires a massive increase in content to cause a compartment syndrome. Also, this compartment blends anatomically with the muscles of the thigh, allowing extravasation of blood outside the compartmental envelope. This case report is of a patient whose medial circumflex femoral artery was severed during a total hip arthroplasty through a posterior approach leading to compartment syndrome of the buttock. Although this clinical presentation has not been described as compartment syndrome, one similar presentation was described in the literature. **Key words:** interstitial pressure, medial circumflex femoral artery, compartment syndrome, total hip arthroplasty.

A 68-year-old woman with degenerative arthritis of her right hip underwent a cementless hip arthroplasty (Biomet, Warsaw, IN) in December 1994. The hip joint was exposed through a posterior approach and the short external rotators were divided at the greater trochanter. The upper border of the quadratus femoris was divided with a diathermy for further exposure. The operation proceeded without apparent intraoperative complications. There was no excessive bleeding during the procedure, and during surgery the patient did not exhibit any abnormal drop in blood pressure. In the recovery room, she was alert and felt well.

On the second postoperative night, the patient had a sharp pain in the right thigh, which was noted to be swollen. She complained of paresthesia of the right leg, corresponding to the sensory distribution of the sciatic nerve; however, neurologic assessment did not reveal any deficit. She was given morphine, but this failed to relieve her pain, which increased over the next 4 hours.

At the time of assessment, the blood pressure was 126/84 mmHg. The pulse remained between 68 and 72 beats per minute. The right lower limb revealed marked swelling and ecchymosis of the right buttock and thigh. Any movement of the right hip caused excruciating pain in that area. There was decreasing neurologic function in the distribution of the sciatic nerve as the patient could no longer dorsiflex the ankle or toes. There was complete loss of sensation over the entire foot and lateral aspect of the calf. Knee extension was present but painful.

An emergency decompression was carried out (within 20 hours of the total hip arthroplasty). The surgical wound was opened. The skin, which was under extreme tension, spread widely when the incision was made. The gluteus maximus initially appeared gray, but appeared viable. A large hematoma (1.5 L of clotted blood) located deep to the gluteus maximus was decompressed. The hematoma extended into the thigh deep to the deep fascia up to its upper two thirds. The gluteal muscles regained a healthy, red color and were contractile to stimulation. No muscle debridement was performed. Bleeding vessels were identified at the lower border of the quadratus femoris and were lig-

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ated. There was bruising of the sciatic nerve but no evidence of intraneural hemorrhage. The wound was closed primarily. The patient needed a total of 5 units of packed red blood cells while she was in hospital. In the recovery room, function of the anterior and posterior tibial muscles was noted, and 3 days later, there was improvement in the function of the extensor and peroneal muscles. Thereafter, there was rapid return of nerve function. Six months after the operation, the patient had regained full motor control, and the sensation was normal.

Discussion

The diagnosis of a compartment syndrome involves a high index of suspicion. This syndrome is better described by the 4 S's: severe pain (out of proportion to the clinical situation), stretch pain, sensory abnormalities, and swollen and tense muscles [1]. Severe breakthrough pain resistant to analgesics is usually the earliest symptom of compartment syndrome [2]. Although various techniques of measuring compartment pressures have been developed, controversy exists over definition of compartment syndromes on the basis of a specific tissue pressure [3].

This syndrome in the gluteal region and thigh, although not common, has been reported earlier with femur fractures [4,5], with soft tissue contusion [6], with vascular injury [7] (superior gluteal artery rupture), following intramedullary fixation [4], and with coagulopathy [8]. Bleeding is a common cause for an increase in the contents of a compartment. Various mechanisms causing the vascular complications following total hip arthroplasty have been well described [9,10]. In a posterior approach to the hip joint, branches of the medial circumflex femoral artery can be damaged when the upper part of the quadratus femoris is divided. Inadvertent laceration of the artery may cause massive hemorrhage if unrecognized, particularly in elderly patients who are often receiving deep vein thrombosis prophylaxis with anticoagulant drugs. Troublesome bleeding can be prevented by meticulous surgery, and if a vessel is divided, hemostasis must be achieved.

Sciatic nerve palsy following subgluteal hematoma formation after prophylactic or therapeutic anticoagulation has been well documented [8,11]; however, direct damage to the medial circumflex femoral artery causing compartment syndrome of the hip and sciatic paralysis is rare. This case report resembles a case (no. 3) reported by Fleming et al.,

who discussed five cases of sciatic paresis that developed as the result of hemorrhage following hip surgery [11].

Pain on passive stretching of the muscles in the posterior compartment is tested for by extending the knee while holding the hip in flexion. Severe buttock pain, marked swelling in the thigh, and a distal sciatic neural deficit in the lower limb of a patient who has had hip surgery are evidence of a compartment syndrome of the buttock. Early recognition and prompt surgical decompression are suggested to prevent irreversible damage.

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