MANAGEMENT OF BILATERAL FEMORAL NECK FRACTURE IN A NONAGENARIAN PATIENT - CASE REPORT

D. Popescu¹, C. Trandabaţ², B. Puha¹, B. Veliceasa¹, O. Alexa¹
University of Medicine and Pharmacy “Grigore T. Popa” - Iaşi
Faculty of Medicine
1. Department of Surgery
2. “Sf. Spiridon” County Clinical Emergency Hospital, Iasi
* Corresponding author. Email: dragospopescu1975@yahoo.com

MANAGEMENT OF BILATERAL FEMORAL NECK FRACTURE IN A NONAGENARIAN PATIENT-CASE REPORT (Abstract): Simultaneous bilateral femoral neck fracture is rare injury. Cases with this type of fracture have been reported in the literature since the 1950s, following the introduction of electroconvulsive therapy which generates violent hip muscle contractions. In young patients' simultaneous bilateral femoral neck fracture results from high energy trauma (car accident or fall from height) in a normal bone. Pathological changes in bone structure occurring in chronic kidney disease, vitamin D deficiency, osteomalacia, osteoporosis, metabolic imbalances and administration of corticosteroids explain the occurrence of this particular type of fracture following low-energy trauma. We present the case of a 90-year-old female patient who suffered a simple fall from her own height resulting in a Garden IV bilateral femoral neck fracture. Our therapeutic option in this patient was bilateral uncemented bipolar hemiarthroplasty in a single session using a single tray of sterile surgical instruments and two sterile drapes. Postoperative outcome was very good, allowing the initiation of functional recovery on the first postoperative day. Uncemented hemiarthroplasty proved to be a good choice in such a patient in the associated diseases may trigger the risk of cardiovascular disturbances specific to bone cement implantation syndrome. Keywords: BILATERAL HIP FRACTURE, HEMI-ARTHROPLASTY, CEMENT IMPLANTATION SYNDROME, LOW ENERGY TRAUMA, SINGLE STAGE REPAIR.

Bilateral femoral neck fracture resulting from low energy trauma is uncommon and only few cases have been reported in the literature. It is more commonly associated with electroconvulsive therapy and tonic-clonic seizures and may occur in young adults following high energy trauma. The presented case reflects our experience in managing an elderly patient (nonagenarian) with significant cardiovascular comorbidities and who benefited from surgery in a single session.

CASE REPORT

A 90-year-old patient presented to the emergency department following a low energy trauma following same-level fall at home, resulting initially in partial and soon after total functional impairment. The patient was known with type 2 diabetes treated with oral antidiabetic drugs and diabetic sensori-motor polyneuropathy. Cardiovascular pathology was represented by grade III hypertension and chronic ischemic heart disease associated with significant carotid
atheromatous disease and a recent ischemic stroke. Initial clinical examination performed in the emergency department raised the suspicion of a bilateral hip fracture because the legs appeared shortened and significant externally rotated. Classical radiological examination of the pelvis confirmed the clinical suspicion of bilateral hip fracture with bilateral intracapsular femoral neck fracture Garden IV (fig 1).

Immediately after admission the patient was examined by the anesthetist in order to assess if the patient can withstand general or spinal anesthesia. Cardiological assessment recommended to delay surgery and changes in therapeutic doses to normalize high blood pressure and heart rate. Surgery could be performed 48 hours following trauma and anesthetic consultation considered general anesthesia safer than spinal anesthesia regarding the expected duration of surgery and severity of cardiovascular disease. The first option of the surgical team was uncemented bipolar hemiarthroplasty in a single session in both hips. The patient was placed in supine position and the approach was the one usually used by the operating team, namely anterolateral. First we performed right hip replacement and then using the same tray of sterile instruments we performed a new draping and hemiarthroplasty in the contralateral hip using the same size prosthetic components in the right hip. Postoperative surveillance was done in the anesthesia and intensive care unit, and transferred to the orthopedic unit on the first postoperative day. After postoperative radiological assessment which confirmed a sufficient bone stock and the correct calibration and placement of prosthetic components, functional recovery first through passive and then active hip movements, with resumption of walking using a walker and full weight bearing since the second postoperative day (fig. 2).

The occurrence of these bilateral fractures following a low energy trauma accurately described by the patient excluding the possibility of an episode of seizure, raised the suspicious of significant changes in bone structure and density and a DXA scan of the forearm and spine was performed. Serological tests showed: mild hypothyroidism (TSH = 5.02 UUI/ml), PTH = 22.63 pg/ml, and vitamin D deficiency (7.91 ng/ml) for which therapy with
Vigantol was initiated. The severe changes captured by DXA scan of the lumbar spine, including multiple vertebral compressions and secondary scoliosis made the results uninterpretable. The occurrence of hip fracture automatically included the patient into the severe osteoporosis group although the obtained forearm values suggested osteopenia ($T$ score -1.5).

Postoperative course was favorable both in terms of surgical wound healing and rehabilitation program and resumption of walking using a walker and full weight bearing. The patient was discharged on postoperative day 7 and referred to a specialized rehabilitation and physiotherapy unit. Clinical and radiological assessment at 3 months postoperatively showed a good function of both hip joints that allows independent walking over short distances using an walker. Radiological assessment of the pelvis revealed prosthetic components correctly calibrated and positioned and preservation of good quality bone in the proximal femur bilaterally.

DISCUSSION

Bilateral femoral neck fracture is extremely rare; a small number of cases being published in the literature. The introduction of electric shock therapy in the treatment of mental disorders occasionally resulted in bilateral femoral neck fractures due to the strong muscle contractions. The first reports of this fracture were published in the 1960s in this kind of patients (1).

High-energy trauma specific to polytrauma and electrocution are the main cause of these fractures when they occur in normal structure bone. Bone loss specific to primary bone disease, osteomalacia, osteoporosis or secondary changes in chronic kidney disease explain the occurrence of bilateral lesions following simple fall from the same level (2).

Transient osteoporosis of pregnancy was involved in the occurrence of bilateral femoral neck fracture during pregnancy in a 35-year-old patient who was not a victim of trauma (3).

Being a rare fracture it is often underdiagnosed as the clinical and radiological exams are focused on the hip whose symptoms are more dramatic. For this reason, X-ray of the pelvis and both hips can capture this rare lesion in confused patients suffering from neurological or psychiatric illnesses or following seizures.

Several variants of therapeutic approach have been presented in the literature starting with less invasive interventions such as orthopedic reduction followed by osteosynthesis up to simultaneous total hip arthroplasty. Sood A. et al. published in 2009 a similar case in which the bilateral fracture was the result of low energy trauma (fall from own height) in which their surgical option was bilateral cemented hemiarthroplasty through the anterolateral approach in supine position in a single session (4). In our patient, the intraoperative finding of sufficient bone stock and significant cardiovascular comorbidity that could favor the occurrence of rhythm disturbances, hypoxia and hypotension specific to bone cement implantation syndrome were strong arguments in favor of uncemented arthroplasty (5). Although the number of published cases of bilateral femoral neck fracture is limited, a high mortality rate of about 50% in elderly patients with associated comorbidities and of only 25% in young patients is reported (6). In most cases the cause is delayed surgery and rapid development of complications related to bedsores, of which deep vein thrombosis and pulmonary infection are most often fatal. In this respect, treatment guidelines for hip fractures rec-
ommend osteosynthesis or arthroplasty within 48 hours after trauma (7).

Surgery should be done as soon as the medical conditions are safe (8). In our patient the 48-hour preoperative interval was essential for adjusting the treatment for her heart disease and obtaining adequate blood pressure and heart rate so that her life not to be endangered in the perioperative period. McBryde et al. reported the safety and benefits of bilateral hip resurfacing arthroplasty (9). Arguments in favor of the supine position and anterolateral approach were the preference of the surgical team and avoidance of patient repositioning thus shortening the duration of the two successive surgeries.

CONCLUSIONS
The surgical management of our case, a nonagenarian patient with significant associated diseases, was a challenge and the treatment was adapted to its particular conditions. Uncemented hemiarthroplasty proved to be a good choice in such a patient where the associated diseases may trigger the risk of cardiovascular disturbances specific to bone cement implantation syndrome. Our therapeutic option in this patient was a bilateral uncemented bipolar hemiarthroplasty in a single session using a single tray of sterile surgical instruments and two sterile drapes. The possibility of treating both hips in the same session, thus minimizing the adverse effects of anesthesia, was a great advantage in a patient of extreme age and cardiovascular comorbidities. Early diagnosis and rapid identification and correction of imbalances that may delay surgery were the two steps essential for a successful treatment.

REFERENCES