

## SURGICAL TREATMENT OF PATHOLOGICAL FRACTURE OF THE FEMUR USING THE METHOD OF INTRAMEDULLARY OSTEOSYNTHESIS - A CASE REPORT

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### Summary

Breast cancer is a malignant neoplasm with the highest incidence in female population, along with malignant tumors of the female genital tract. Depending on how far the disease has spread, distant metastases are most frequent in the lungs and in the skeleton. Additionally, widespread malignant disease may result in paraneoplastic syndrome with metabolic disbalance of the whole body. A well-known paraneoplastic syndrome that occurs in cancer patients is hypercoagulability, consequently resulting in deep venous thrombosis and embolism. A 52-year-old female patient was admitted to the traumatology unit of the Clinical Hospital Osijek, Clinic of Surgery with intertrochanteric fracture of the right femur. It was a pathological fracture, type 31-A3. Seven weeks prior to admission the patient had had right mastectomy due to malignant carcinoma. After two weeks of cytostatic therapy the patient had cerebrovascular insult that resulted in left hemiparesis, which gradually subsided. It was decided to treat the fracture using intramedullary osteosynthesis with proximal femoral nail. We consider the intramedullary osteosynthesis the method of choice whenever it can be applied, depending on the fracture type. The application of osteosynthesis generally enables earlier patient mobilization. Furthermore, surgical procedure takes less time and blood loss is significantly reduced.

KEYWORDS: *paraneoplastic syndrome, pathological fracture, intramedullary osteosynthesis*

### OPERACIJSKO LIJEČENJE PATOLOŠKOG LOMA NATKOLJENIČNE KOSTI METODOM INTRAMEDULARNE OSTEOSINTEZE - PRIKAZ SLUČAJA

#### Sažetak

Karcinom dojke, uz malignome genitalnoga sustava, maligna je neoplazma s najvećom incidencijom u ženskoj populaciji. Ovisno u stupnju proširenosti bolesti, udaljene su metastaze najučestalije u plućima i skeletu. Dodatni problem koji se može javiti u proširene maligne bolesti je i paraneoplastični sindrom u smislu općeg metaboličkog disbalansa. Nerijetko se paraneoplastički sindrom manifestira hiperkoagulabilnošću, i posljedično dubokom venskom trombozom i embolijskim komplikacijama. Na Odjel za traumatologiju Klinike za kirurgiju KB Osijek liječili smo bolesnicu u dobi od 52 godine. Bolesnica je primljena zbog intertrohanternog loma desne natkoljениčne kosti. Radilo se o patološkom lomu tipa 31-A3. Sedam tjedana prije primitka na naš Odjel učinjena je desnostrana mastektomija zbog malignoga karcinoma. Dva tjedna nakon započete citostatske terapije dolazi do cerebrovaskularnog inzulata s posljedičnom lijevostranom hemiparezom blažeg stupnja koja se postupno povukla. Odabrana je metoda intramedularne osteosinteze proksimalnim femoralnim čavlom. Mišljenja smo kako intramedularna osteosinteza treba biti metoda izbora uvijek kada ju ovisno o tipu loma možemo primijeniti. Primjenom takvog osteosintetskog sredstva u pravilu je moguća ranija mobilizacija. Također, trajanje operacijskog zahvata kao i gubitak krvi bitno su manji.

KLJUČNE RIJEČI: *paraneoplastički sindrom, patološki lom, intramedularna osteosinteza;*

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## INTRODUCTION

Breast cancer is a malignant neoplasm with the highest incidence in female population, along with malignant tumors of the female genital tract (1). Heredity is considered a significant predisposing factor in breast cancer development, which has become evident by identification of proto-oncogenes BRCA1 and BRCA2 (2). In addition, the incidence is significantly higher in women who have not given birth as well as in women giving birth over the age of 30 (3). The most frequent type of breast cancer is invasive ductal carcinoma (IDC), at incidence rate of 75%. Prognosis and dynamics of disease depend not only on histological type of tumor, but also on its dimensions, location and hormone dependence. Quadrantectomy or mastectomy is possible surgical procedure, but axillary exploration is absolutely necessary to determine the stage of the disease and to choose the appropriate treatment method, since invasion of regional lymph nodes occurs first in axillary and parasternal lymph nodes. Additionally, widespread malignant disease may result in paraneoplastic syndrome (4) with metabolic disbalance of the whole body. A well-known paraneoplastic syndrome that occurs in cancer patients is hypercoagulability, consequently resulting in deep venous thrombosis and embolism. Depending on how far the disease has spread, distant metastases are most frequent in the lungs and in the skeleton. Bone and joint structures that are most frequently affected by distant metastases are vertebral bodies in the first place and the long bones of the limbs. Thus, in patients with widespread breast cancer as well as with other widespread malignant diseases pathological fractures frequently occur (5). The topic of pathological fractures and their management remains controversial. Namely, the invasivity of the method applied in bone treatment needs to be balanced against the quality of life remaining to patients in the terminal phase of disease. However, surgical treatment is indicated in certain number of cases. Intramedullary osteosynthesis is considered the best option in lower limbs fractures (6-8). Special attention should be paid to appropriate preoperative preparation of patients. A multidisciplinary approach is required in such cases, which involves an orthopedic surgeon/traumatologist, anesthesiologist, oncologist and transfusionologist. It is crucial to choose minimal invasive

method of surgical treatment and the least hazardous anesthesia, as well as to overcome metabolic disbalance and adjust oncologic therapy to surgical procedure.

## CASE REPORT

A 52-year-old female patient was admitted to the traumatology unit of the Clinical Hospital Osijek, Clinic of Surgery with intertrochanteric fracture of the right femur. It was a pathological fracture (Figure 1), type 31-A3 (9).

Seven weeks prior to admission the patient had right mastectomy due to malignant carcinoma. Pathohistological analysis revealed that it was invasive intraductal carcinoma. Furthermore, technetium scintigraphy did not show distant metastases in the bone and joint system. Since the patient had normal postoperative course after the mastectomy, peroral cytostatic therapy was started. After two weeks of cytostatic therapy the patient had cerebrovascular insult that resulted in left hemiparesis, which gradually subsided. Computed tomography confirmed ischemic insult ex-



Figure 1. Pathological intertrochanteric fracture of the femur



Figure 2. Intraoperative osteosynthesis of pathological intertrochanteric fracture

cluding any central nervous system metastases. Taking into account the kind of disease, we considered emergency surgery was not indicated. Instead, the emphasis was placed on the improvement of patient's general condition and regulation of metabolic disbalance. The leg was immobilized by temporary horizontal traction using sandbags. The patient was examined by anesthesiologist, transfusiologist, oncologist and neurologist to make appropriate preoperative preparation for the surgical procedure, which was performed two days after admission. The method of intramedullary osteosynthesis with proximal femoral nail (Figure 2) was chosen.

The early postoperative course was uneventful, so that as soon as drains were removed the patient was helped into standing position with partial weight-bearing on the right leg. Due to pronounced catabolic activity the wound healing was prolonged to a certain degree, in spite of protein supplements administered parenterally. The sutures were removed on the fifteenth day and the patient was referred to in-patient psychiatric treatment.

## DISCUSSION AND CONCLUSION

Pathological fractures are frequent in patients with metastasized breast cancer, yet their treatment is still a controversial topic. Nevertheless, we consider that surgical treatment should be applied in case of pathological fractures of lower limbs. In this way early mobilization can be achieved and decubital complications can be avoided as well as the risk of hypostatic pneumonia. Early mobilization is also highly significant for prevention of deep venous thrombosis in case of disturbed metabolism and coagulation function. Furthermore, it is considerably significant for prevention of muscle mass loss, which is highly expressed in such patients due to tumor-induced cachexia. These are potential complications of long-term immobilization that would substantially deteriorate general condition and quality of life in patients with widespread malignant disease. As in all patients with deteriorated general condition, it is best to perform surgery in 24 to 48 hours after the fracture and admission to hospital, as soon as general condition has improved and metabolic disbalance has been regulated. In our opinion surgery should not be delayed longer than three days for the mortality rate in postoperative course of such patients is potentially higher due to late mobilization. Along with appropriate preoperative preparation, selection of osteosynthetic material is also important. In our opinion intramedullary osteosynthesis is the method of choice whenever it can be applied depending on the fracture type. The application of this osteosynthetic material enables early mobilization. Furthermore, surgical procedure takes less time and blood loss is significantly reduced. Therefore, proximal femoral nail is the best method in treatment of this type of intertrochanteric fracture, not only because of significantly lower comorbidity but also because of its biomechanical characteristics.

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