TREATMENT OF GERIATRIC ACETABULAR FRACTURES WITH A MODULAR ACETABULAR CUP SYSTEM

Introduction

Age-related traumatology patients are often characterized by geriatric secondary diagnoses and fractures associated with osteoporosis. In the future, the proportion of this trauma surgery and orthopaedic patient group will increase due to longer life expectancy and the demographic change in society. The treatment goal for ortho-geriatric patients is primarily the rapid restoration of the joint function through a load-stable one-stage surgical treatment in order to reduce the risk of postoperative complications due to prolonged bed rest. By regaining everyday autonomy as early as possible, geriatric patients can avoid a longer period of post-inpatient care dependency.

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Anamnesis

An 85-year-old female patient with severe pain symptoms and questionable trauma was brought to our clinic by rescue services from a nursing home. The patient had dementia with a pronounced urge to move and a tendency to fall, however she showed no neurological abnormalities. Immobilising pain was present for the patient at in the right pelvic and groin area. The right eye was marked by a ring-shaped bruise (monocular haematoma) (Fig. 1). In the past, the patient had already fallen several times in the nursing home. There she used a wheeled walker as a walking aid, with which she was independently mobile.

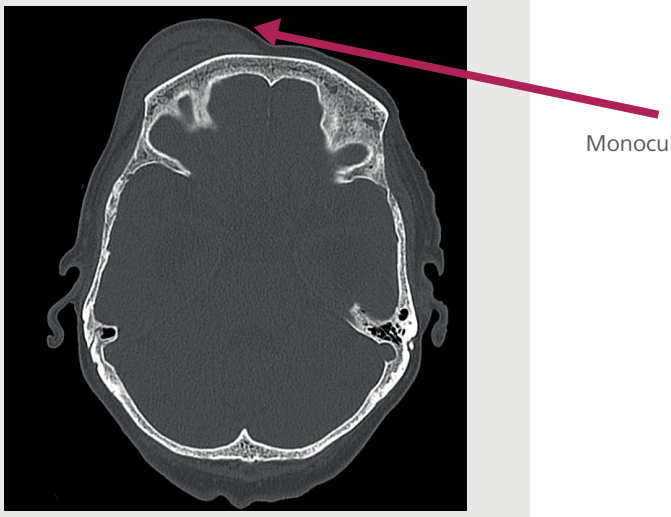


Fig. 1 Monocular haematoma within the CT image

Diagnostics

The clinical examination revealed a shortening of the right leg by 2 cm. In addition, there was pronounced right-sided pelvic compression and groin pressure pain. Movement in the right hip joint was suspended in all planes due to pain and accompanied by crepitations. Analgesia was already started preclinically. Furthermore, the patient suffered from significant comorbidities (urinary tract infection, arterial hypertension, coronary heart disease, diabetes mellitus type II, hypothyroidism, chronic obstructive pulmonary disease, osteoporosis). 52 years ago, she had suffered a pulmonary embolism. She was fitted with a DDD pacemaker 11 years ago.

A detailed analysis of the acetabular fracture situation and the condition of the multimorbid patient was carried out to plan the specific treatment. The initial diagnosis included computed tomography (CT) images of the head, facial skull and pelvis as well as a radiological pelvic overview image and axial Lauenstein projection of the affected hip.

CT-scans of the head and the facial skull showed the monocular haematoma (Fig. 1) and a nasal bone fracture (Fig. 2). The diagnostic imaging of the hip and pelvis was performed using standard radiologic images (Fig. 3 a, b) and CT imaging (Fig. 4a to e). The patient had sustained a complex right-sided acetabular fracture with central dislocation of the hip joint. According to acetabulum fracture classification of the acetabulum by Judet and Letournel[1], a type 10 combination injury (two-column fracture) was diagnosed. According to the AO classification, it was an acetabular fracture of type 62 C-3 with a fracture of both columns extending into the sacroiliac joint.

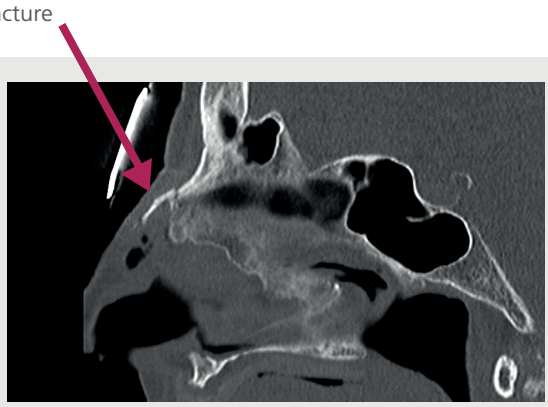


Fig. 2 Nasal bone fracture in the two-dimensional tomographic image of the facial skull

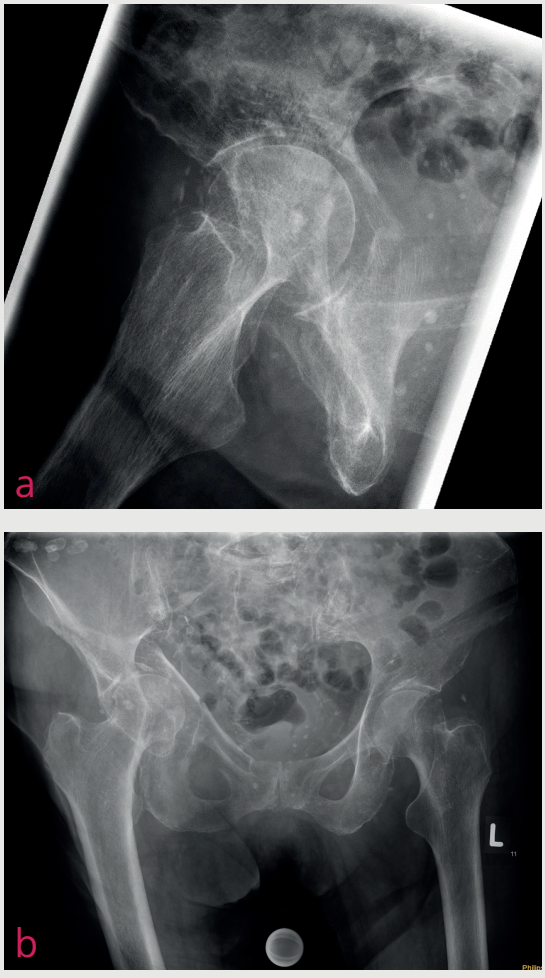
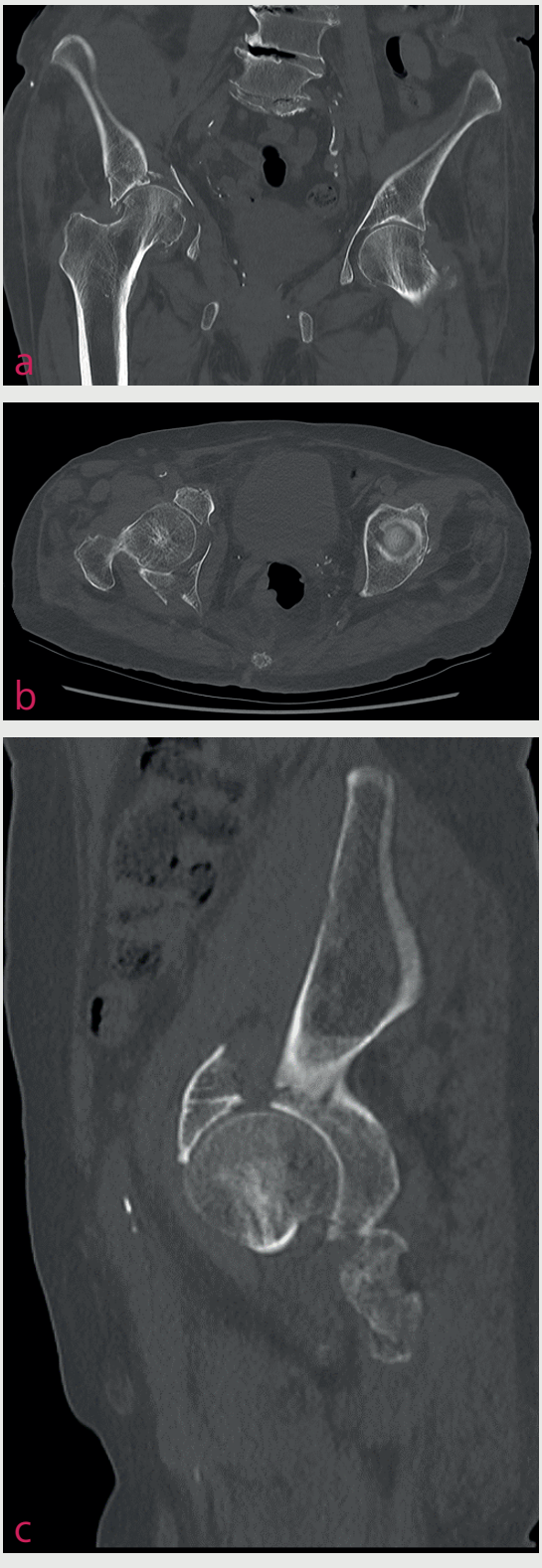


Fig. 3 Axial Lauenstein projection (a) and pelvic overview a.p. (b), right hip, situation after trauma and dislocated acetabular fracture



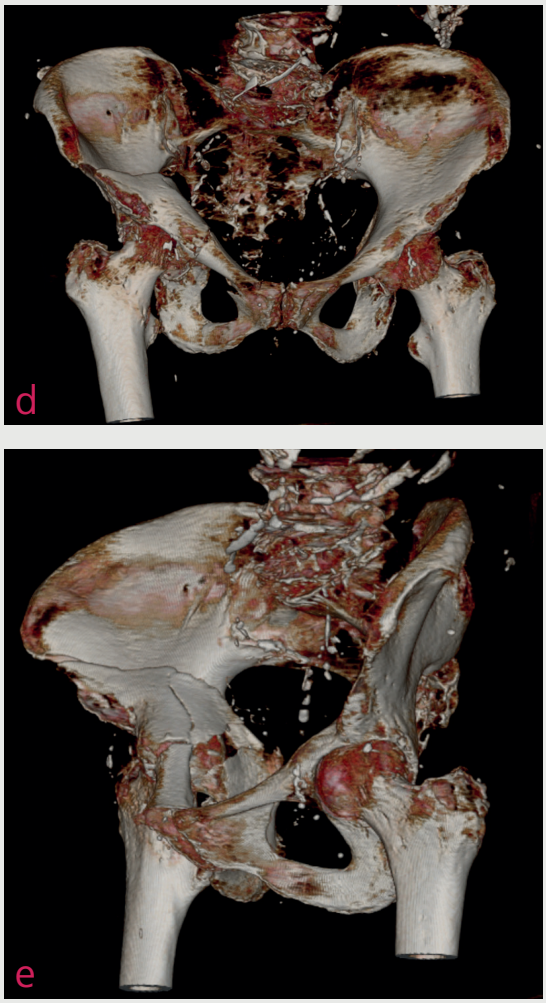


Fig. 4 Fracture situation of the right hip joint of the 85-year-old female trauma patient in the two-dimensional tomographic image (a, b, c) and in the three-dimensional image (d, e)

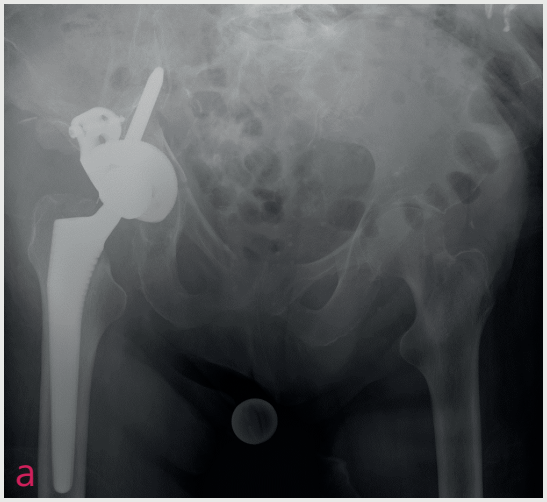
Treatment

The patient's preoperative physical condition was classified as ASA IV (severe systemic illness that is a permanent threat to life) according to the ASA classification.[2]

The surgical treatment was performed according to the preoperative planning with a cementless modular revision cup (MRS-TITAN Maximum, PETER BREHM GmbH) in order to create a full weight-bearing situation (Fig. 5). A revision cup (56 mm, iliac peg 70 mm) was inserted using the minimally invasive direct anterior approach (DAA) with expansion according to Levine.[3] An additional osteosynthesis was not necessary. The X-ray control confirmed the correct position of the prosthesis components and stable joint conditions (Fig. 6).

Fig. 5 MRS-TITAN Maximum revision cup with intramedullary peg anchorage (modular iliac peg 70 mm)

Fig. 6 Intraoperative X-ray control of the cup position



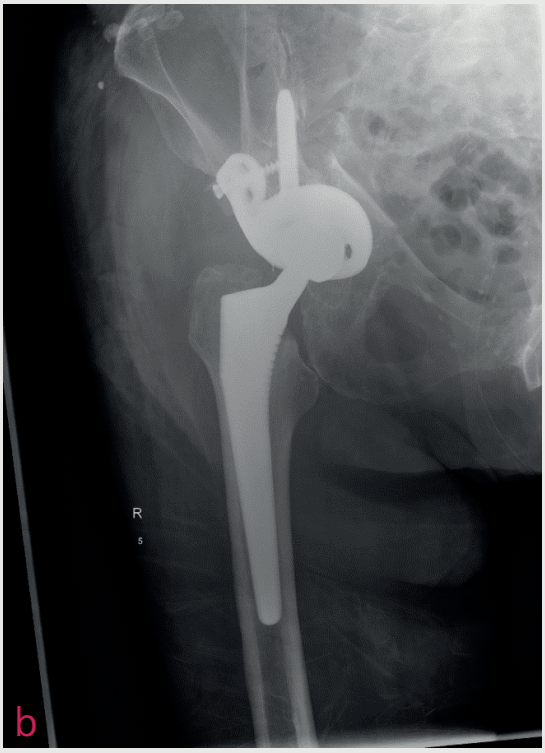


Fig. 7 Postoperative radiological control (a, b) after stable fracture treatment with the MRS-TITAN Maximum revision cup (strap, screw fixation, iliac peg)

Result

A good load-stable treatment of the acetabulum fracture was achieved using the MRS-TITAN Maximum revision cup with strap screw connection and iliac peg. The radiological control showed an unchanged good placement of the revision cup (Fig. 7 a, b). No perioperative or implant-associated complications occurred. From the 5th day after the operation, the patient was mobilised with pain-adapted full weight-bearing of the operated limb on a high walking frame under physiotherapeutic guidance. The wound healed without complications, so that the elderly patient could be discharged to the retirement home for geriatric early rehabilitation treatment. Physiotherapy treatment and gait training were continued.

This ortho-geriatric case of a dislocated acetabular fracture shows that the stable fracture treatment with the cementless modular revision cup MRS-TITAN Maximum in a single-stage procedure leads to a good functional result. After 12 weeks postoperatively, the elderly patient was symptom-free.

References

[1] Letournel E, Judet R. Fractures of the Acetabulum. Springer Verlag, 2. Aufl. 1993.

[2] ASA – American Society of Anesthesiologists, ASA Physical Status Classification System. https://asahq.org/

[3] Beaulé PE, Griffin DB, Matta JM. The Levine Anterior Approach for Total Hip Replacement as the Treatment for an Acute Acetabular Fracture. J Orthop Trauma. 2004;18(9):623-629. doi: 10.1097/00005131-200410000-00008.

Figure sources

Fig. 1 to 4, 6 and 7 Elisabeth-Krankenhaus Thuine
Fig. 5 PETER BREHM GmbH