Analysis of complications resulting from femoral neck fracture treatment using Targon FN system

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Abstract
The study was aimed to assess the outcomes of the operative procedure applied in the patients with the femoral neck fracture, treated with the Targon FN system, manufactured by Aesculap, and identify relationships between the outcome of treatment of the femoral neck fracture, patient’s body mass, length of the period between the moment of injury and surgery, age of patient, prescribed medications. Study criteria were met by 19 patients aged between 25 and 87 and the average follow-up time was 20 months. Over the period between the surgery time and the study time, 3 patients died. The diagnosed complications included fracture below the implant (plate), aseptic necrosis of the femoral head, pseudarthrosis of the femoral neck and deep vein thrombosis. The joint functionality was assessed using the Harris Hip Score, where excellent and good results accounted for 70 per cent of all results. Given the low-invasiveness of the surgery, this is a recommendable method that allows for the preservation of the patient’s hip joint, early rehabilitation and bringing patient to the vertical position. Complications were primarily diagnosed in the patients who had a postponed surgery, i.e. over 4 days after the injury involving 31B3 fracture according to AO.

Keywords: femoral neck, Targon FN, fracture, pseudarthrosis, necrosis, thrombosis

Streszczenie
Celem pracy jest ocena wyników leczenia operacyjnego chorych ze złamaniem szyjki kości udowej zaopatrzonych przy użyciu systemu Targon FN firmy Aesculap oraz znalezienia zależności wyniku leczenia od typu złamania, masy ciała, czasu od urazu do zabiegu operacyjnego, wieku pacjenta, przyjmowanymi lekami. Kryteria badania spełniało 19 chorych w wieku od 25-87 lat, średni czas obserwacji wynosił 20 miesięcy. W okresie od chwili operacji do przeprowadzenia badania zmarło 3 chorych. Stwierdzono powikłania takie jak złamanie poniżej płytki, jałowa martwica głowy kości udowej, staw rzekomy szyjki kości udowej i zakrzepica żyły głębokich. Funkcję stawu oceniono przy pomocy skali Harris Hip Score uzyskując 70% wyników doskonałych i dobrych. Biorąc pod uwagę małoinwazyjność zabiegu jest to metoda wartą polecenia pozwalająca na zachowanie własnego stawu biodrowego, wczesną pionizację i reha-bilitację. Powikłania stwierdzono przede wszystkim u chorych operowanych w trybie odroczonym, i z typem złamania 31B3.

Słowa kluczowe: szyjka kości udowej, Targon FN, złamanie, staw rzekomy, martwica, zakrzepica
Introduction

Anatomical reposition of the fracture and its stabilization using the Targon FN (manufactured by BBraun/Aesculap, Germany) is an effective mode of management of the intra-capsular femoral neck fracture [1-5]. Similar outcomes of the femoral neck fracture treatment were obtained after stabilizing fracture with the cannulated compression screws [6,7], SHS system [8] supplemented with the cortical bone graft obtained from fibula [9] and the Targon PF nail (BBraun/Aesculap, Germany)[10]. A large number of surgeons recognize total arthroplasty [11] or hemiarthroplasty [12, 13, 14] as the most effective procedures in the femoral neck fracture treatment in elderly patients.

Aim

The study is aimed to assess complications emerging in the procedure where Targon FN system (manufactured by BBraun/Aesculap, Germany) was applied in adult patients with the femoral neck fracture.

Material

Retrospective analysis included radiological documentation and outcomes of the post-hospital consultations of 19 patients (11 females and 8 males) treated with the reposition of fracture and stabilization using the Targon FN system (manufactured by BBraun/Aesculap, Germany), treated in the Clinic of Orthopedics and Traumatology, University Clinical Hospital in Lodz, Poland, in the years 2015-2018. The operated patients were aged 25-87 (mean age: 69 years). The follow-up time ranged between 6 and 40 months (mean time: 20 months). Each surgery was preceded by X-ray diagnostics and AO fracture classification. Next, functional results were assessed using the Harris Hip Score during the appointment in the outpatients’ clinic, which actually “completed orthopedic treatment.”

Results

Three patients were excluded from the functional testing (2 females, 1 male) due to death after discharge from hospital. The joint functionality was assessed using the Harris Hip Score. Excellent and good results accounted for 70 per cent of all results.

<table>
<thead>
<tr>
<th>Number</th>
<th>Kind of complication</th>
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<tr>
<td>I</td>
<td>fracture below implant</td>
</tr>
<tr>
<td>II</td>
<td>aseptic necrosis of femoral head</td>
</tr>
<tr>
<td>III</td>
<td>pseudarthrosis of femoral neck</td>
</tr>
<tr>
<td>IV</td>
<td>deep-vein thrombosis</td>
</tr>
<tr>
<td>V</td>
<td>death after discharge</td>
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</tbody>
</table>

Female patient aged 71 (31B1 according to AO) was diagnosed with the fracture below the implant 14 weeks after surgery and had no any other injuries. The original surgery was performed 4 days after injury. Patient was permanently treated with Pradaxa (oral anticoagulant) due to the chronic atrial fibrillation. CT test revealed osseous symphysis after the femoral neck fracture.

34-year old male patient (31B3 according to AO) with mental disability did not respond to any postoperative recommendations. Patient had limited limb mobility and complained of pains. Radiograph performed 22 months after surgery revealed aseptic necrosis of the femoral bone.
Doppler ultrasonography made in 63-year old female patient (31B1 according to AO) 19 days after surgery due to the calf pain intensifying during the foot movements revealed deep vein thrombosis. Patient, who earlier received no relevant medications due to chronic diseases, was operated on the first day after injury.

**Discussion**

Operative procedure adjusted to the local and general condition of the patient is the only option that allows for the restoration of mobility after treatment of the femoral neck [1-14].

Our material proves that the most serious complications occurred in the patients who had a postponed surgery, i.e. over 4 days after injury involving a 31B3 fracture. Our study reveals no relationship between the outcome of treatment and the patient's age, body mass or received medications. The best results of treatment were obtained in the patients operated on the first or second day after injury involving a 31B1 fracture [7, 9,11].

**Conclusion**

An effective mode of treatment of the femoral neck fracture is early reposition and stabilization using the Targon FN system (manufactured by BBraun/Aesculap, Germany). A crucial factor that has a negative impact on the functional and radiological outcome is postponed treatment of the fracture, particularly with a considerable dislocation of fragments.
References


