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MIKOŁAJA KOPERNIKA
W TORUNIU
Wydział Lekarski
Collegium Medicum w Bydgoszczy

Rafał Wójcicki

Czynniki wpływające na leczenie operacyjne złamań panewki stawu biodrowego i rozwój choroby zwyrodnieniowej.

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Promotor:

Dr hab. n. med. Jan Zabrzyński, prof. UMK

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Summary

Pelvic fractures are a serious challenge for orthopedic surgeons and often require multidisciplinary treatment of the patient. Surgical treatment of these fractures is complicated by the frequent occurrence of additional injuries, both coexisting limb fractures, and moreover injuries to the chest, abdominal cavity and head. This fact is primarily due to the high-energy nature of these injuries. Hip acetabulum fractures are the result of high-energy forces in the range of 2,000–10,000 N and constitute approximately 3% of all fractures. The energy of the injury affects the area of the acetabulum and head of the femur, which consequently may lead to post-traumatic changes. The main effect is accelerated osteoarthritis.

The studied group consisted of patients qualified for surgical treatment of the acetabulum according to the AO criteria. The studied group was treated in a single center - trauma center. All patients were qualified for open reduction and internal stabilization, with plates dedicated to hip acetabulum fractures. Population included in the study underwent diagnostic imaging using X-rays and computed tomography of the pelvis. Demographic data were also collected on admission. The classification of fractures was based on the system invented by Judet and Letournel. The operations were performed using two main surgical approaches - Kocher-Langenbeck and ilioinguinal approach.

In the studied group, after a 2-year follow-up period, hip arthroplasty was performed in 20.8% of patients due to post-traumatic degenerative changes after acetabular fracture. The analysis of the used surgical approaches showed, that the Kocher-Langenbeck approach increased the risk of subsequent primary hip arthroplasty almost 12 times more often than the ilioinguinal approach ($p = 0.016$). Moreover, the waiting time for surgery significantly influenced the performance of post-traumatic hip arthroplasty, with each additional day of waiting for surgery increasing the risk of using an endoprosthesis by 89% ($p = 0.001$). Investigating the certain factors influencing the acetabular fractures treatment, no statistically significant differences were found between the various morphological types of acetabulum

fractures and the BMI value, duration of surgery, length of hospital stay and the number of units of blood transfused. However, patients undergoing posterior wall stabilization required fewer transfusions of blood units compared to other morphological types of acetabular fractures (0.33 units)($p = 0.056$). The shortest operation time was also found in this group of patients ($p = 0.01$).

Acetabular fractures are a serious injury for patients due to their strong connection with secondary post-traumatic osteoarthritis, the incidence of which was 20.8% in the studied group. The surgical approach used during surgery and the waiting time for surgery were significant factors influencing the risk of secondary hip osteoarthritis. Factors, such as BMI, duration of surgery, blood loss and hospital stay, are not directly correlated with the morphology of acetabular fractures, the presence of concomitant injuries and the specific morphological type of fracture. The exception are fractures of the posterior wall of the acetabulum, which are characterized by a reduced amount of transfusions of blood units in the postoperative period and the shortest time of surgery.

Summary of original articles

Original article I

"The Association between Acetabulum Fractures and Subsequent Coxarthrosis in a Cohort of 77 Patients—A Retrospective Analysis of Predictors for Secondary Hip Osteoarthritis"

Objective: The aim of the study was to determine the frequency of total hip arthroplasty after hip acetabular fracture surgery and to determine factors predisposing to secondary, post-traumatic hip osteoarthritis with the need to perform total hip arthroplasty.
Material and methods: The study included 77 consecutive patients admitted to the clinic between 2012 and 2019 for hip acetabular fracture surgery. The inclusion criteria were acetabular fractures with indications for surgical treatment. Exclusion criteria were

acetabular fractures with indications for nonoperative treatment, fractures requiring primary hip arthroplasty, and periprosthetic acetabular fractures. Demographic data regarding surgical treatment and subsequent reconstructive surgery were collected retrospectively. The minimum postoperative follow-up period for each patient was 2 years. A total of 77 patients were included in the study and the mean age was 53 years.
Results: After a 2-year follow-up period, hip arthroplasty was performed in 16 (20.8%) patients due to post-traumatic degenerative changes. The analysis of the surgical approaches used showed that the Kocher-Langenbeck approach increased the risk of subsequent primary hip arthroplasty almost 12 times more often than the ilioinguinal approach ($p = 0.016$). Moreover, the waiting time for surgery significantly influenced the performance of post-traumatic hip arthroplasty, with each additional day of waiting for surgery increasing the risk of using an endoprosthesis by 89% ($p = 0.001$).
Conclusions: Acetabular fractures are devastating injuries for patients due to their strong association with secondary post-traumatic osteoarthritis. The incidence of secondary hip osteoarthritis after acetabular fracture in the study was high (20.8%). Surgical approach and waiting time for surgery were significant factors predicting secondary hip osteoarthritis and the need for subsequent total hip arthroplasty

Original article II

“The Association of Acetabulum Fracture and Mechanism of Injury with BMI, Days Spent in Hospital, Blood Loss, and Surgery Time: A Retrospective Analysis of 67 Patients”

Objective: The aim of the study was to assess the relationship between acetabular fractures and factors such as mechanism of injury, BMI value, hospital stay, blood loss and duration of surgery.

Material and methods: The study included 67 patients admitted to the clinic for pelvic acetabular fracture surgery in 2017–2022. Data were collected prospectively at a single center, a trauma center. The inclusion criteria were acetabular fractures with indications for surgical treatment. Exclusion criteria were acetabular fractures with indications for nonoperative treatment, fractures requiring primary hip arthroplasty, and periprosthetic acetabular fractures. Upon admission, all patients underwent diagnostic imaging using X-ray and pelvic computed tomography.

Results: The study did not find statistically significant differences between the studied groups of patients with various morphological types of pelvic acetabular fractures and the BMI value, duration of surgery, length of hospital stay and the number of units of blood transfused. Patients who experienced a fracture as a result of a fall from a height required a greater number of transfusions of blood units (2.3 units) than others with a different mechanism of injury ($p = 0.07$). Patients undergoing posterior wall stabilization required fewer blood unit transfusions compared to other morphological types of acetabular fractures (0.33 units) ($p = 0.056$). The shortest operation time was observed in the group with a fracture of the posterior wall of the pelvic acetabulum ($p = 0.01$).

Conclusions: Factors such as BMI, duration of surgery, blood loss and hospital stay were not directly correlated with the morphology of acetabular fractures, the presence of accompanying injuries and the specific type of fracture. Patients whose mechanism of injury was a fall from a height required an increased number of blood transfusions compared to other groups. Fractures of the posterior wall of the acetabulum according to the Judet and Letournel classification are characterized by a smaller number of transfusions of blood units in the postoperative period and the shortest duration of surgery.