B0372

Clinical outcome of arthroscopic fixation for glenoid fracture using a double threaded screw

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Background: The glenoid rim fractures with a small bony fragment are generally treated by suture anchor technique. However, when the bony fragment is large, osteosynthesis would be performed using screws. The purpose of this study is to evaluate clinical outcome of arthroscopic fixation for glenoid fractures using double threaded screws.
Material and Methods: Ten patients who underwent arthroscopic fixation of glenoid fracture were included in this study. Nine patients had glenoid rim fractures (Ideberg type Ia), and one patient had a glenoid transverse fracture associated with body fracture (Ideberg type IVa). The surgeries were performed in all arthroscopic procedure. After reduction of the bony fragment, labrum around the fragment was repaired by suture anchors. Then, the bony fragment was fixed by a double threaded screw. Mean follow-up duration was 25 months. Japanese Orthopaedic Association (JOA) score, Constant score, Japanese Shoulder Society (JSS) shoulder instability score, and Rowe score were assessed.
Results: The average of JOA score, Constant score, JSS shoulder instability score, and Rowe score at final follow-up were 95.2 points, 83.4 points, 90.9 points, and 96.5 points, respectively. Bony union was acquired in all cases at three months after the surgeries without any pain. Postoperative CT scan revealed protrusion of the screw head in eight cases without symptom. The removals of the screws were performed in six cases. In two cases, the patients refused removal of the screws because they were asymptomatic.
Discussion: Fixation of the bony fragment of the glenoid fractures using the double threaded screw was rigid, and early bony union was successfully achieved. Although the screws were arthroscopically inserted underneath the articular cartilage, follow-up CT scan showed protrusion of the screw head inside the joint. To avoid the unnecessary complication, the position and insertion angle of the screw should be carefully planned.
Conclusion: The clinical results of arthroscopic fixation for glenoid fracture using a double treaded screw were satisfactory.
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B0393

Arthroscopic treatment of greater tuberosity avulsion fracture using a double-row technique in elderly

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Background: Arthroscopic treatment of greater tuberosity avulsion fracture using a double-row technique was reported with a good result in many authors. But few authors evaluate the effectiveness of this procedure in elderly.
Material: A retrospective analysis was made on the clinical data of 13 patients with the acute greater tuberosity avulsion fracture after acute shoulder dislocation. There were 2 males and 11 females with an average age of 64.6 years (range, 60-73years). 3 left shoulders and 10 right shoulders were affected. Methods : All cases accepted arthroscopic treatment using a double-row technique with anchor. The cases were evaluated by X-ray films, VAS score and UCLA score.
Results: All cases were successfully performed operations and all cases were followed up 12-35 months (mean, 16.1 months). X-ray films of all cases showed good reduction after operation immediately. But 4 cases showed mal reduction in X-ray films after surgery 3 days, and 2 cases of those were revised by cannulated screw and suture. 1 case showed mal reduction in X-ray films after surgery 3 weeks. The failure rate was 38.5%. The average fracture healing time was 8.7 weeks (range, 6-12weeks). At last follow-up, the mean VAS score was 1.5 ± 1.2, the mean UCLA shoulder function score was 29.3 ± 2.1.
Discussion: Osteoporosis was often accompanied in the elderly especially in female. The suture screw usually could not insert tightly in the greater tuberosity site without cortical bone when the greater tuberosity fractured. The screw or outside row suture would loose after surgery in some cases.
Conclusion: Although the functional recovery was satisfactory, arthroscopic treatment of greater tuberosity avulsion fracture using a double-row technique with high failure rate was not a good choose in elderly patients.
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B0395

Postoperative flexion balance is improved after TKA by modified gap technique with imageless navigation

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Background: A goal of total knee arthroplasty (TKA) is to obtain symmetrically balanced extension and flexion gaps. To balance the gaps during surgical procedure, two surgical techniques are commonly used. One is measured resection technique (MRT), and the other is gap balancing technique (GBT). Imageless navigation assisted TKA is originally based on MRT in which bony landmarks are used to determine proper component placement. In this technique all bone cutting was underwent with the assistance of the navigation and soft tissue balancing was subsequently carried out to make rectangular shaped gap. Although imageless navigation is known to be useful to accurately reconstruct the mechanical axis of the lower limb, there are some cases in which gap balancing between extension and flexion is difficult after the bone cutting. GBT is reported to offer superior reliability in obtaining proper flexion and extension gap compared to MRT. To obtain both correct mechanical alignment and more well-balanced gap, we have started modified GBT (MGB) TKA with the assistance of imageless navigation since 2013. Therefore, the purpose of this paper is to characterize our current operative technique and to clarify effectiveness of this method to achieve well-balanced gap.
Surgical technique: The Stryker imageless navigation system (Precision version 4.0), which do not need intraoperative fluoroscopy or preoperative CT images, is used for computer-assisted implantation. Following a conventional medial midvastus approach, bony landmarks such as Whiteside line, epicondylar axis and tibia AP axis are registered into the computer navigation. Firstly, distal femoral cut and proximal tibial cut are made perpendicular to the mechanical axis with extramedullary cutting blocks positioned under navigation guidance. The created extension gap is evaluated with a spacer block and soft tissue release or osteophyte resection is performed to obtain the rectangular extension space. Once the rectangular extension gap is created, the extension and flexion gaps are measured at full extension and at 90 degree flexion of the knee by applying 40N torque to the tensioner. Then the difference of the two gaps (extension gap − flexion gap) is calculated and the necessary thickness of posterior condyle bone resection is estimated. The femoral anterior/posterior and chamfer cutting block (4 in one femoral cutting block) is positioned by monitoring on the navigation screen. The navigation system offers real-time feedback of femoral rotation, the risk of anterior femoral notch and the thickness of posterior femoral bone resections. To obtain equal extension and flexion gaps, the position of the femoral cutting block is adjusted to the estimated necessary bone resection value as well as controlling femoral rotation and anterior femoral notch risk. When the flexion gap before bone resection is trapezoidal, femoral rotation is adjusted to maximum 1 degree external or internal from the neutral position on the navigation.
Method: From April 2012 to March 2015, total 144 knees were replaced using imageless navigation. Femoral rotation and flexion gap was determined by conventional MRT between April 2012 and March 2013. Between April 2013 and March 2015, the navigation assisted MGB was utilized. Inclusion criteria in this study is varus osteoarthritis knees and CR type TKA. Twenty-three knees by MRT and 39 knees by MGB were enrolled. Pre-operative variables were recorded, including age, sex, body mass index, frontal alignment, and range of motion. Axial radiograph of the distal femur was taken by the method of Kanekasu et al at 3 months after operation and the flexion soft tissue balance was evaluated. Lift off angle (LOA) of femoral component, which was the angle between tibial cutting line and posterior condylar axis (PCA), was measured on the axial radiograph. The number of outlier of a LOA, which was defined as a deviation >3 degree of the varus or valgus, was compared in both group. Post-operative LOA and outlier of LOA were compared in both group using student t-test.
Result: There was no statistically significant difference in terms of demographic characteristics between MRT group and MGB group. Mean post-operative LOA was 2.3 ± 2.7 degree varus in MRT group and 1.2 ± 1.7 degree varus in MGB group ($p<0.05$). Mean post -operative LOA in MGB group was significantly lower than in MRT group. In other words, flexion balance in MGB group was significantly more rectangular than in MRT group. Outlier in MRT group were 7 cases (30.4%) and in MGB group were 3 cases (7.7%). Outlier decreased significantly in MGB group ($p<0.05$).
Conclusion: The surgical technique by MGB with the assistance of the imageless navigation was shown in detail. In terms of flexion balancing, there was statistically significant improvement in the MGB group compared to MRT group at postoperative axial X-ray of the distal femur. Also there were less outlier more than 3 degree in MGB than MRT. Navigation assisted MGB would improve soft tissue balancing than conventional navigation assisted TKA.
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B0396

Efficacy and safety of self-flip technique of tightrope RT button for anterior cruciate ligament reconstruction

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Introduction: The TightRope RT (Arthrex, Naples, FL) is a fixation device for anterior cruciate ligament (ACL) reconstruction. The TightRope RT has an adjustable loop that fits all sizes of tunnels, and it is not necessary for orthopedic surgeons to create an extra socket (6 to 7 mm) to facilitate button flipping. Therefore, relatively short femoral tunnels will be beneficial for anatomic soft tissue ACL reconstruction. However, there is no side suture in the TightRope RT button for flipping. In addition, there is a potential risk that the button will be pulled too far off the lateral femoral cortex into the soft tissue and lead to inappropriate positioning of the button on the vastus lateralis muscle or fascia, because the loop of the TightRope RT is long. So far, various techniques have been reported to seat the TightRope RT button appropriately on the lateral cortex of the femur. However, the reported techniques are relatively difficult. Therefore, our novel technique (Self-flip Technique) was introduced for the button flipping.
The purpose of the present study was to investigate the efficacy and safety of the technique of the button for ACL Reconstruction.