The Hemiarthroplasty Procedure with Austin-Moore Prosthesis in the Treatment of Displaced Femoral Neck Fractures

Technical Aspects and Their Role in the Functional Results

Healthcare

Keywords: hemiarthroplasty, prosthesis, Austin- Moore, fracture, femoral neck.

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Abstract

Purpose. The assessment of the frequency of during surgery technical errors about the implantation of Austin-Moore prosthesis for the patients treated at our hospital. Review of the technical aspects for the implantation of Austin-Moore prosthesis. **Patients and Methods.** We retrospectively reviewed the medical records and radiographs of all our patients, treated with the Austin Moore prosthesis, problems that have arisen during the surgery, the initial problems, prosthetic failures etc. **Results.** 48% of patients had at least one intra-operatory error, 14% of cases had intra operatory fractures. Mistakes had significant correlation with the surgeons experience who have conducted the hemiarthroplasty with Austin Moore prosthesis. **Conclusion.** Austin Moore prosthesis is difficult to implant and requires skilled surgeons with good experience and good technique. When using this type of prosthesis in the fractures of the femoral neck the case should be selected very well.

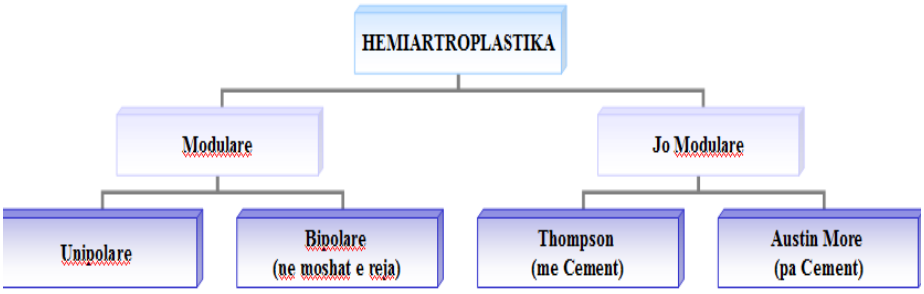
Introduction

The treatment of femoral neck fractures is still a debatable issue. Hemiathroplasty is the most used surgical procedure for intracapsular femoral neck fractures. It is the prefered surgery not only for neck fractures but aso for nounions, avascular necrosis or bone tumors of femoral neck and head. Beyond the recent development in surgical techniques for hip surgery the Austin Moore hemiarthroplasty remains the most used method for hip surgery in our country. The good short and long term results , reduced cost and the familiarity of many surgeons with the technique are among the reasons for this choice of treatment for displaced femoral neck fractures in eldery people. In recent years bipolar, modular or total hip arthroplasty are frequenty used for this type of fracture treatment with similar or better resuts. The first Austin Moore prosthesis was used in 1940 with minor modifications during the decades. Improvement in surgical approach, neck osteoptomy, canal preparation also were made. Radiologic criteria for the evaluation of accuracy of prothesis implantation were described.This criteria were matched with clinical outcomes (residual pain, limp, leg shortness) and loosing of the prosthesis through years. Technical errors during implantation are common and may affect clinical outcomes in short or long term results.

Errors in the implantation of Austin Moore prostheses are frequent and it presents great difficulties when fitting it in. The poor support in medial calcarin femoral, insufficiency of the femoral neck fractures left from the osteotomia, the insufficiency of metaphysical filling, errors in measuring the denture associated with residual pain or even failure of the denture. Not in a few cases such procedures are performed by young surgeons and without experience, and in difficult conditions, which increases the possibility of intraoperatory errors.

Why Austin Moore?

The theoretical advantage of bipolar prosthesis over those unipolar is to reduce Acetabulum erosion because the movement in the two poles of denture causes less movement of the head of that denture and acetabulum and decrease the pain during the movements of articulacion.



Use of bipolar prosthesis is challenged by numerous studies showing that in a short period after implantation, the inner carrying weight movement converts bipolar protozoa in a uni-polar implant. Low cost of Austin Moore denture makes this to be the most applied prostheses in our service.

Advantages of Modular prostheses

Component of the neck length can be adapted according to the tension of abductors, femoral neck can be adapted without increasing the length of bias, and it can be converted easily in total prosthesis.

Disadvantages

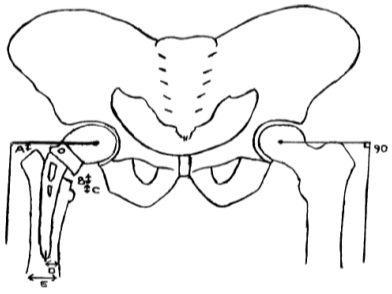
Partial Endoprosthesis mainly with Austin Moore denture has over 30 years that is being used in our service, especially the last 10 years the number of cases is significantly increased. It is reserved mainly for older ages over 65. Despite the advantages that has this intervention for these ages (rapid activation of the patient and as a result the prevention of thrombosis) again we have seen a series of problems associated with functional outcomes such as providing continuing pain and loosening. In these conditions we thought to make a modest study to evaluate our technical errors during the implementation of Austin Moore prostheses and to define which of postoperatore radiological parameters are associated with residual pain or loosening of prostheses.

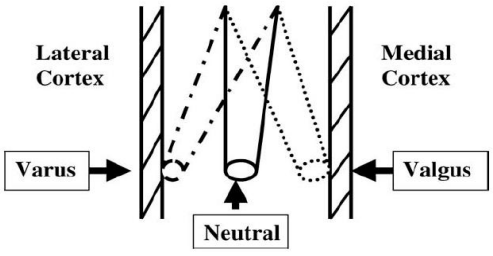
Purpose of the Study

• The purpose of this study is to assess the technical aspects of the implantation of Austin Moore prostheses in the neck fractures with displacement of femur, evaluate their effects on functional outcomes for patients operated in our clinic.
• Assessment of the frequency of intrasurgery errors during implantation of Austin Moore prostheses in our service.
• Review of the technical phases of Austin Moore denture implant.

Patients and Methodology

We've chosen for our study 112 patients hospitalized in our service during the period January 2008-March 2013 with Dg. Fracture Colli Femoris to whom it has been implemented Austin Moore partial denture. All patients had an average of 1 year pursuit.





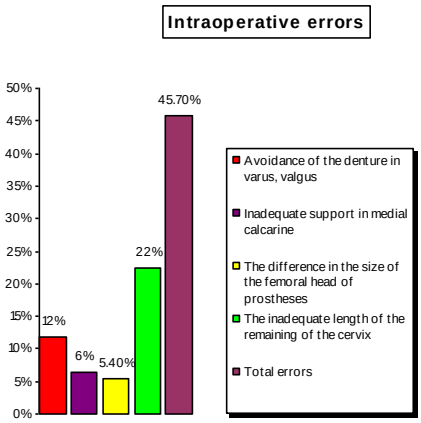
In each case were taken into consideration these values:
• The length of the cervix remaining in medial calcarine
• Support of the denture in medial calcarine
• The head of prostheses compared with the other side
• The degree of varus and valgus of cation systems in medular channel

These radiological criteria were analyzed by comparing patients with good results and patients who had residual pain and loosening. Data were used from clinical files (radiographs before and after intervention) route entry operators and any other complication. Periodic checks of patients to assess residual pain and analysis of causation according to the issue. Radiographs and technical accuracy of implantation of prostheses were evaluated using the methods described by the Sheriff and Parker. The length of the cervix remained inadequate (should be <12mm). It is measured from the upper edge of trokanter minor up to Margot's risky femoral calcaneum. The support of the denture in media neck calcaneum. (it should be <1 mm). The difference in the size of the the femoral head of prostheses compared with the other side. The diameter of the denture should be 2 mm greater because it is calculated the thickness of the articular cartilage. In cases when they have had other illnesses or other endoprosthesis the head is measured intraoperatively.

Results

From 112 ill-patients taken for this study, only 94 of them had the opportunity of this study until the end of the first year. The most frequent error was the inadequate length of the remaining of the cervix among 21 cases (22.3%). Also the avoidance of the varus of denture among 11 cases (11.7%). Intraoperative periprosthetic fractures were found in 9 cases (8.2%) which were resolved with cerclage wire.

Intraoperative errors	Nr.	%
The inadequate length of the remaining of the cervix	21	22.3 %
Inadequate support in media calcarine	6	6.3 %
The difference in the size of the femoral head of prostheses	5	5.4 %
Avoidance of the denture in varus, vulgus	11	11.7 %
Total errors	43	45.7 %



Assessment of the results at the end of the first year

84 % of the cases with intraoperative errors have had residual pain and loosening.

With no pain or mild pain after physical strains	58	62%
Residual pain	36	38%
Loosening	4	4.5%

Discussion

The remained inadequate neck is the most frequent error and in many cases it is associated with the residual pain and revision of the early denture. In some cases inadequate femoral neck it is not by shortening but it is by very steep plan of fracture and even more it is from a worse preoperator plan ratler than it is an intraoperatory mistake. Deviation of the axis of the denture in varus, valgus remains in second place and it is very important. Periprotethic fractures remain a problem that must be taken into account to prezent them. Fracture occurs at the time of implantation of prostheses and during its readjustment. Even foreign authors give approximate data to those of our study. Sharif & Parker in a study of 243 cases reveal that the unsupportive denture in calcarin media is the main cause of residual pain whereas the non-adequate length of the remaining neck has a role in both results (residual pain + loosening) while the difference of the size of the femoral head is associated with residual pain but not loosening. P. Weinrauch in a study of 147 cases where it is used Austin Moore prosthesis reveals that 48% of the patients have a mistake in intraoperation, and 14% have made periprothetic intraoperatory fractures. Proximal fixation of the implant is very important for a successful surgical act. A good fixing provides mechanical stability and allows transplant denture to be placed in the windows of the prostheses to be consolidated as a single body. This prevents obesity in calcar and thus avoids diving, loosenig, luxation, the failure of the denture.

The best rating of pre-femoral surgical canal

• Correct Osteotomy of the femoral neck
• To avoid communication of the femoral calcar
• To be stored at least 1 cm of the neck at the level of femoral calcar
• To be inserted the outline of the femoral canal at the level of the piriformis fossa
• Not to be used the rasp in the wide femoral channel
• To be chosen the suitable implant in order to fill the proximal femori without causing communication
• To be used the orientor of antiversion in the proximal denture hole of the protheses during its insertion
• The most important area is that of media side near femoral calcar
• The windows of the denture should be well filled with denture implants and neck well supported in femoral media calcar

A painful prosthetic Austin Moore has two primary reasons:

• Proximal Fixation nonadequate
- Loosening
- Absorption of femoral calcar
- Immersion of denture
- Loss of varus orientation in the denture
• Erosion of Acetabular cartilagos

Conclusion

Intraoperatory errors during implantation of Austin Moore prostheses are relatively frequent. Hemiartroplastics with Austin Moore is a technically difficult operation. It should be made a good selection of cases that have indication for implantation of this prosthetic. There is a clear correlation between the intraoperator error, residual pain that require early revision of the denture.

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