

Clinical-radiological results of the tibial osteotomy of valgization by internal addition in Gonarthrosis.

Mohammed Elhasany *, Amine Boumaiz, Mohamed Madhar, Hanane Elhaoury and Rachid Chafik.

Department of orthopedie traumatology, IbnTofail hospital, Mohammed VI university hospital center, FMPM, Cadi Ayyad University, Marrakech, Morocco.

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Abstract

In knee osteoarthritis, medial-opening tibial osteotomy remains a good surgical technique, and have been effective in stabilizing and even improving osteoarthritis, Our study is about 20 cases of gonarthrosis on genu varum, treated by opening wedge valgus high tibial osteotomy conducted within the orthopedic trauma department " B" of the University Hospital Mohamed VI of Marrakech, over a period of 4 years. The mean age of our patients was 49 years (39-60), with a sex ratio of 1M/4F. In 55% of cases (11 cases) the gonarthrosis was related to primitive genu varum, while 45% cases (9 cases) was secondary to trauma or meniscectomy. Clinically the knee pain was the main symptom in all cases, with an intensity level 3 on the simple verbal scale. The imagery was designed to measure angular deviations and surgical correction and monitoring the evolution. Angular deviation adjusted mean was 10.3 ° (6 ° -16 °), stages II and III of Ahlback classification, represent the most cases of tibiofemoral osteoarthritis (90%). The filling was done by autologous bone graft, and the average degree of varus correction was 9.6 °. The results evaluated by the IKS score were excellent or good in 60% of cases for the knee score and 73% for the function score.

Keywords: Gonarthrosis; Osteotomy; Tibia; Open wedge; Genu varum

1. Introduction

Osteotomies for gonarthrosis have been practiced for more than half a century and have proved to stabilize the arthrosis process, and improve the quality of life of patients by reducing the intensity of pain and improving the functioning of the knee. Our study of 20 cases, aims to illustrate the contribution of valgization tibial osteotomy (OTV) by internal addition in the treatment of internal femoro-tibial gonarthrosis on genu varum.

2. Patients and methods

This is a retrospective study of 20 cases of internal gonarthrosis on genu varum, treated by tibial osteotomy of valgization by internal addition, conducted in the traumatology-orthopedic department "B" of the Mohamed VI University Hospital Centre of Marrakech, over a period of 4 years. Patient records were analyzed from the department archives and operating unit records. The patients were contacted and summoned by mail and telephone for post-operative evaluation with an average decline of 2 years and 2 months. The data exploitation was based on a pre-established operating sheet covering all epidemiological, radiological, and therapeutic data.

*Corresponding author: Mohammed Elhasany

3. Results and analysis

Our series includes 20 patients with an average age at the time of intervention of 49 years (39-60), and a sex ratio of 1/4, overweight is noted in 12 patients (60%), 11 patients had primary varum knee gonarthrosis while 7 patients had a history of knee trauma, and 2 patients with internal meniscectomy. Gonalgia was the main symptom in all cases, with a level 3 intensity on the simple verbal scale, although walking abnormalities were noted: limitation of the perimeter of walking (<1000 meters) in 14 patients, squabbling in one patient. The pre-operative planing included: a pangonogram with bipodal support, a standard cliché of the front and profile of the knee and the support, the median corrigated DAC angular deviation was 10.3° with extremes of 6° and 16°. 70% of patients had Ahlback stage II (classification adopted for the staging of gonarthrosis) and 30% were spread between stage I and III. It was a tibial osteotomy of valgization by internal addition with autologous transplant filling taken from the homolateral iliac crust, the target correction was 3° (0° corrected by +3° of the physiological valgus), and controlled per-operatory by the cable method, the fixation was ensured by screwed plate controlled in peroperative by brightness amplifier. The immobilization was ensured by rigid knee orthosis for 45 days, the contact support was permitted at 45 days and the total support was allowed at 3 months. Our patients benefited from 20 (+/-5) rehabilitation sessions. Two cases of external hernia rupture were, and no other early or late complications were noted.

Of the 20 patients operated, 15 were reviewed with an average decline of 2 years and 2 months with extremes ranging from 4 months to 4 years. The evaluation of clinical outcomes was based on the IKS score (International Knee Society). Thus, the following results were obtained:

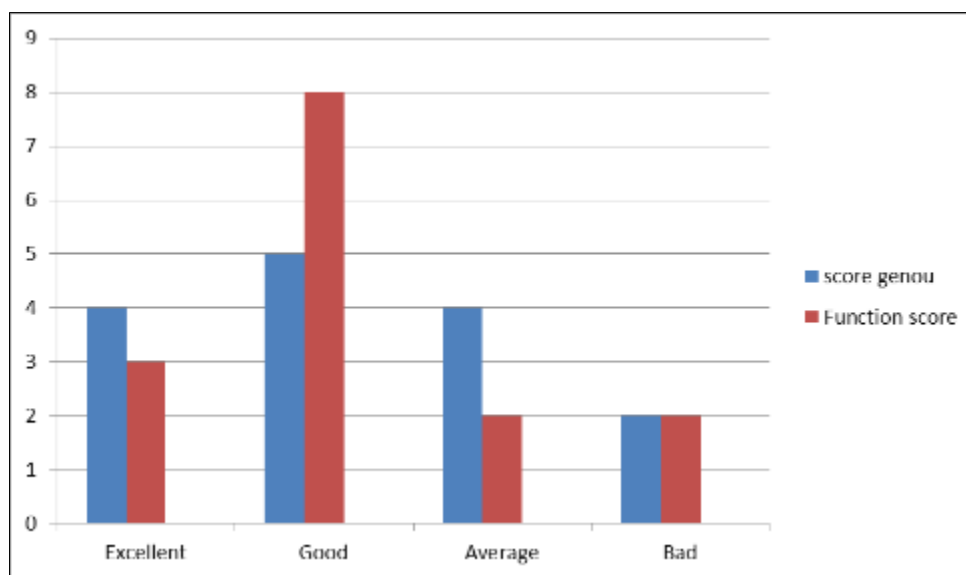


Figure 1 Clinical outcomes evaluated by the IKS score

A marked improvement in post-operative clinical parameters was observed, namely: - Pain that became occasional and/or in the stairs. - A degree of flexion greater than 100° with an average of 110°. - Improved perimeter of walking becoming more than 500 meters in all patients. The radiological assessment of the post-operative angular deviation was studied using a computer tool using the standard postoperative facial X-rays, overlapped on the preoperative pangonograms: by taking the axis references of the limb from the pangonogram that will be projected; subsequently on the standard radiographies allowing the calculation of the correction angle, while the evolution of gonarthrosis was assessed on standard facial and retrograde profile X-ray. Thus we obtained: **Table 1**

Table 1 Postoperative correction

Hypo-correctio	Normo-correction	Hyper-correction
DAC < 3° de valgus	3° de valgus < DAC < 6° de valgus	DAC 6° de valgus
8 CAS (47%)	6 cas (40%)	1 cas (13%)

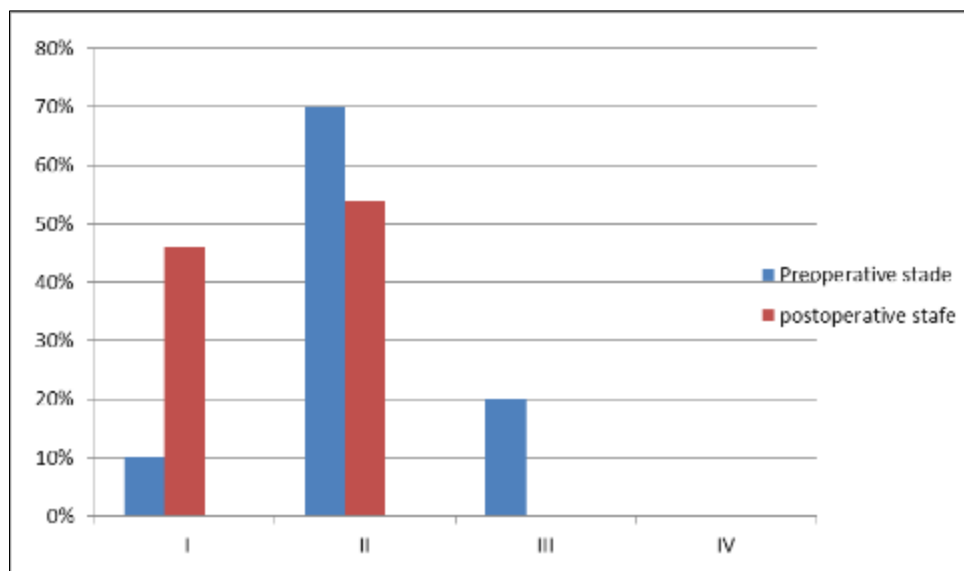


Figure 2 Evolution of gonarthrosis

Stabilization of the stage of internal gonarthrosis was observed for 2 years and 2 months of regression in all patients. Consolidation was achieved in all our patients after an average period of 3 months.

4. Discussion

The age of our patients varies between 39 and 60, which is in line with the authors' recommendations [1], the gender is variably represented, but this parameter does not much influence the indication of the OTV [2], The incidence of primitive varum is higher than that of secondary varum [3], as is the case in our study. Many authors [4,5] reserve tibial osteotomy to gonarthrosis on primary or secondary varum genus and do not recommend it for its inflammatory or metabolic origin, which has also been the case in our selection of patients, given that all of our operated patients had only one gonarthrosis on primitive varum gene (55% of cases) or secondary (45% of cases). Several studies have shown the negative impact of overweight [6], obesity is found in 12 of our patients without correlation with the final results. Pain listed on the simple verbal scale, presented the main reason for consultation, and indication of the OTV after the medical treatment failed, in the review of literature the pain presents the main indicator of the OTV, and the main indikator of its success [3]. With regard to the radiological investigation, all patients received a minimum radiological evaluation sufficient to confirm gonarthrosis and quantify it and then plan its correction [7]. Stages II and III of Ahlback account for the majority (90%) of cases of operated femoro-tibial arthrosis, which is perfectly consistent with the literature with 75.2% in Y.Catonné [8] and 95.5% in F.Lavallé [9], which means that stages 2 and 3 of Achlback constitute the main indication of osteotomias, although a earlier stage is an element of good prognosis [10]. the median corrigated angular deviation DAC found in our study was 10.3°, the maximum tolerated DA for an indication of OTV is 20° given the risk of neurovascular complication it may generate, however Maquet [11] had good results for extreme varus exceeding 15°. Our patient selection seems to be justified, as long as the arthrosis stage is early in 70% of cases, and the maximum noted DAC is 16°. The technique of tibial osteotomy by internal addition is known for its ease of execution in a single cut and without gestures on the peroneum [12], and for its reliability, since it does not cause nervous complications [13]. The recovery of an OTV with a total PTG knee prosthesis is easier on an addition[14]. The intervention begins with a vertical ante-internal incision, taking into account the incision of a future PTG, this pathway is the most used by the different authors [12], the osteotomy is performed on the inner side and directed towards the upper peroneo-tibial joint, oriented by 1 or 2 guide pins previously introduced. The per-operative control of the correction is done by the cable method (electric sculptor's son). To fill the medial opening, the use of autologous bone remains the standard technique widely in the literature [12,13], with the advantage of rapid consolidation, despite its disadvantages (pain, scars, sensitive disorders), bone substitutes are widely used with good results, they have the benefit of ease of use after specific packaging in variable-size corner, and immediate availability and a saving of operating time. Different types of osteosynthesis are used in OTVs in order to maintain the correction obtained, the authors report that the long rigid plates offer superior compression and torsion stability compared to other means of fixation[10]. All our osteotomies were fixed by rigid plates. Hypercorrection in valgus is necessary in osteotomies for internal gonarthrosis without exceeding 6°[15], in our series we have had 8 cases of hypocorrection, which concerns patients with an exaggeration of the initial deviation. Consolidation was achieved in an average timeframe of 3 months,

which is the time by the literature, for a bone transplant filling [15], which is longer when the filling is done by bone substitute.

Clinical results show a satisfactory reduction in pain, this improvement is related to the type of osteotomy used, and the use of bone transplant, which gives less pain compared to bone substitutes [3,15]. The good results of our study are due to the correct selection of patients and the right choice of surgical technique, and are confirmed by the high satisfaction of patients 93%.

5. Conclusion

Internal addition valgization tibial osteotomy remains a preferred intervention in the treatment of medial femoro-tibial arthrosis on varum genu in active young patients. This technique allows precise correction, with the lowest rate of complications. The preservation of bone capital facilitates the subsequent recovery by total knee prosthesis.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed

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