

ORIGINAL
INVESTIGATION

Evaluation of Satisfaction Levels of Patients Undergoing High Tibial Osteotomy

Sarper Gürsu¹, Timur Yıldırım¹, Yalkın Çamurcu¹, Hakan Sofu², Bilal Demir¹, Ahmet İssin³, Vedat Şahin¹

ABSTRACT

Objective: High tibial osteotomy (HTO) is a surgical treatment method applied for isolated-medial gonarthrosis. Successful results were reported in different studies. We have evaluated the satisfaction levels of the patients and the clinical results of HTO.

Materials and Methods: Ninety-nine patients who underwent open wedge osteotomy as the surgical treatment of medial gonarthrosis between the years 2002 and 2006 were included in our study. The mean age at the time of surgery was 54.9 years, and the mean follow-up time was 6.8 years.

Results: Patients were asked whether they were satisfied with the operation or not; 41 of them (41.4%) were completely satisfied, 30 patients (30.3%) were partially satisfied, and 28 of them (28.3%) were dissatisfied. Fifteen patients (15.1%) underwent secondary total knee arthroplasty, and for 2 other patients, arthroplasty was planned. When patients were asked whether they would recommend HTO to others, 74 of them (74.7%) said they would, but 25 patients (25.3%) said they would not.

Conclusion: High tibial osteotomy is a very successful surgical treatment. However, patient satisfaction levels may not be as high as expected. In this regard, when assessing the clinical outcomes of HTO, better methods that include the patients' feedback should be taken into consideration.

Keywords: High tibial osteotomy, varus gonarthrosis, satisfaction, patient

¹Department of Orthopedics and Traumatology, Baltalimanı Bone Diseases Training and Research Hospital, İstanbul, Turkey

²Department of Orthopedics and Traumatology, Amasya Suluova State Hospital, Amasya, Turkey

³Department of Orthopedics and Traumatology, Erzincan University Faculty of Medicine, Erzincan, Turkey

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Correspondance

Sarper Gürsu MD,
Department of Orthopedics and Traumatology, Baltalimanı Bone Diseases Training and Research Hospital, İstanbul, Turkey
Phone: +90 216 357 56 46
e.mail:
sarper154@yahoo.com

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INTRODUCTION

High tibial osteotomy (HTO) is a method performed often for patients having medial gonarthrosis with varus alignment in the lower extremity. It is applied for reducing pain, correcting the alignment, and delaying probable arthroplasty. In the review of existing studies related to this technique, it is seen that quite successful results have been reported. These studies have generally included radiological evaluations and assessed the need for arthroplasty. However, the thoughts about the operation that patients underwent and sometimes the outcome of the operation have been ignored (1-8). In this study, mid-phase results of successive 99 HTO operations performed with the proper indication and technique in our hospital were examined, considering the patients' thoughts about the surgery and the outcomes of the operations.

MATERIALS and METHODS

Ninety-nine successive patients having undergone HTO surgery with the medial open wedge technique due to a diagnosis of varus gonarthrosis in our hospital between the years of 2002 and 2006 were reached and evaluated. Patients having arthrosis apart from the medial compartment and having previously undergone different surgeries in their knees were excluded from the study. All patients were given a standard questionnaire form. Of the patients, 91 were female and 8 were male. The mean age at the time of surgery was estimated to be 54.9 years (ranging from 36 to 72 years). The mean age of female patients was 54.5 years (ranging from 36 to 68 years), whereas the mean age of male patients was 59.9 years (ranging from 41 to 72 years). All patients were operated on owing to a diagnosis of medial varus gonarthrosis by HTO with the medial open wedge technique. The osteotomy line was identified with plates and screws (TST Medical Industry and Trade Limited Company, İstanbul, Turkey) (Figure 1). The mean follow-up time was 6.8 years (ranging from 6 to 10 years).

Statistical Analysis

While performing statistical analysis of the data, Mann-Whitney U-test and chi-square test were used for comparing independent variables. The value of statistical significance was considered to be $p \leq 0.05$.



Figure 1. Preoperative and postoperative roentgenograms of a patient having undergone medial open wedge osteotomy due to isolated varus gonarthrosis

RESULTS

When patients were asked whether they were satisfied with the operation or not, it was found that 41 of them (41.4%) were completely satisfied, 30 patients (30.3%) were partially satisfied, and 28 (28.3%) were dissatisfied. The mean ages were 54.5 years (ranging from 41 to 71 years) for the patients completely satisfied with the operation, 55.3 years (ranging from 47 to 67 years) for the patients dissatisfied with the operation, and 55.1 years (ranging from 36 to 72 years) for the ones partially satisfied with the operation. No statistically significant difference was found in the satisfaction levels of the patients with regard to age ($p>0.05$). In

the evaluation of the satisfied and partially satisfied patients together (71.7%), the mean age was revealed to be 54.7 years (ranging from 36 to 72 years).

Four male patients (50%) and 24 female patients (26%) specified that they were not satisfied with the operation. The mean satisfaction duration of the patients was found to be 54.1 months (ranging from 0 to 120 months) in the last control examination. When patients were asked whether they would recommend the surgery to others with similar diseases, 74 of them (74.7%) said they would, but 25 patients (25.3%) said they would not. When the rate of the patients who would recommend the operation was compared to those with complete satisfaction or partial satisfaction with the operation, the results were found to be in parallel, and no statistical difference was detected ($p>0.05$).

Moreover, it was revealed that 15 patients (15.1%) underwent total knee arthroplasty approximately in 5 years (ranging from 3 to 7 years) after HTO (Figure 2), and 2 other patients were given appointments for the surgery of total knee arthroplasty (total 17 patients, 17.2%). The implants of 17 patients (17.2%) were removed due to plate-screw irritation in approximately 2.3 years (ranging from 1 to 5 years). Two patients (2%) underwent arthroscopic articular cartilage debridement in approximately the 17th postoperative month (ranging from the 14th to 20th months). In 2 patients (2%), HTO revision was performed due to a closed osteotomy site and implant failure in approximately the 7th postoperative month (ranging from the 2nd to 12th months). In addition, greffonage was carried out in 2 patients due to lack of healing in the line of the osteotomy in approximately postoperative month 9.5 (ranging from the 7th to 12th months).

DISCUSSION

High tibial osteotomy (HTO) is a method performed often for patients having isolated medial gonarthrosis, with successful results. Up to now, many academic studies have been conducted on this technique. The operation success is generally evaluated with radiological results and scoring methods. In these studies, the satisfaction levels of patients have not been investigated directly, or the outcomes of surgery have not been evaluated (1-6). Nonetheless, as in all orthopedic operations, the primary aim of HTO is to resolve the patient's problem, not to correct the images in radiographies. Therefore, the thoughts of patients about the operation are significant while evaluating the success rate of surgical treatment.

In many studies in the literature, the most important indicator of survival after HTO is reported to be the rate of using knee arthroplasty. In the series of Akasaki et al. (9), which was conducted with 15 cases having undergone lateral closed wedge osteotomy and who needed arthroplasty as a result of the follow-up examinations, the mean time of using a prosthesis after operation was reported to be 9.6 years. Furthermore, Bae et al. (10) stated that arthroplasty operation was performed in the 12th year after HTO in 13 patients who had undergone closed wedge osteotomy. W-Dahl et al. (4) analyzed data on 3161 HTO operations, most of which were open wedge osteotomy, and they found that the rate of returning to arthroplasty in 10 years was approximately 30%. Gstöttner, who examined the data of 134 patients having been exposed to lateral closed wedge osteotomy, reported a rate of returning to arthro-



Figure 2. Radiological image of total knee arthroplasty performed due to the progression of arthrosis in one of the patients having undergone HTO

plasty in 5 years of 6%. At the end of a 12.4-year-follow-up period, this rate was evaluated to be 39.6% for the same patients (1). Benzakour reported the number of those returning to arthroplasty as 23 in a series including 192 cases, with a mean follow-up duration of 15 years (11). In the series of Madan et al. (12), including 68 cases, arthroplasty was needed in 16 patients (23.5%) in approximately 3.7 years. In our case, with a mean follow-up duration of 6.8 years, total knee arthroplasty was performed or planned for 17.2% of patients within approximately 5 years. Thus, it can be said that the 5-year survival rate was about 83%.

Surgical treatments other than arthroplasty can also be needed in some situations after HTO. For instance, in the study of Benzakour, in which 23 patients needed arthroplasty, he stated that revision was performed for 37 patients due to some reasons, such as the need for osteotomy, removal of implant, and infection (11). In the series of Efe et al. (13), with 199 diseases and a mean follow-up time of 9.6 years, the number of cases with progression to arthroplasty was found to be 36. However, it was specified that different complications were observed in 38 patients (19%) when complications requiring reoperation, such as lack of healing in the tibia, were also involved. Similarly, an exact number was not given in the study of Giagounidis, and it was stated that complications, including pseudoarthrosis, infection, and artery injury, developed in 30.9% (14). In our study, secondary surgeries that were performed for the patients having undergone HTO, apart from arthroplasty, were evaluated, and 23 surgical interventions, 17 of which were removal of the implants, were needed after HTO. It is well known that any previously performed surgical intervention will increase the risk for infection in patients who undergo total knee arthroplasty. Furthermore, it should be remembered that anesthesia that is used in an additional surgery is not risk free. In this case,

we think that evaluating the success of HTO considering only the rate of the need for arthroplasty will not be sufficient.

In the study of Papachristou et al. (2), it was specified that the results obtained were excellent in 61.3% of patients, good in 20.4%, moderate in 6.8%, and poor in 6.8% of patients. Efe et al. (13) reported the outcome of surgery to be excellent in 54 patients, good in 74 patients, moderate in 51 patients, and poor in 20 patients. Moreover, in the study of Giagounidis, 33% of patients were found to be very satisfied with the result of operation and 42.6% was satisfied, but 24.5% was dissatisfied (14). In our series, the rate of patients completely satisfied with the operation was 41.4%, the rate of those partially satisfied was 30.3%, and the rate of dissatisfied patients was 28.3%. As a result, although the survival rate appeared to be 83% with regard to the progression to arthroplasty, the rate of 28.3% for dissatisfied patients was remarkable. In the comparison of progression to total knee arthroplasty with the level of satisfaction with the surgery, the rate of dissatisfied patients was found to be higher, which was statistically significant ($p \leq 0.05$).

When our patients were asked about whether they would recommend this surgery to other patients with similar conditions, considering the benefits they gained from the operation, nearly 75% of them said they would recommend, but 25% said they would not. In other words, this shows that almost 1 in 4 patients was dissatisfied with the operation. This rate is similar to the rates reported in the series of Giagounidis (72.3% recommending the surgery and 27.7% not recommending the surgery) (14). In our study, the rate for recommending the surgery was compared to the rate for satisfaction with the surgery, and the results were found to be in parallel, and there was no statistical difference ($p > 0.05$).

In a literature review conducted by Amendola on studies examining the results of HTO, it was specified that Naudie et al. reported a higher survival rate in patients younger than 50 years old. On the other hand, Fletcher et al. (5) considered age above 50 years as a risk factor for revision. Also, in the study of W-Dahl, increasing age was considered to be among the risk factors for revision (4). However, the study of Madan and Birmingham revealed that satisfaction level increased with older age (3, 12). In our study, it was found that the mean age of patients who were satisfied with HTO was lower than that of patients dissatisfied with HTO, but no statistically significant difference was identified ($p > 0.05$).

In the literature on HTO, there are a few studies showing the effect of gender on the result of surgery. In the study of Gstöttner et al. (1), it was suggested that the need for total knee arthroplasty emerged earlier in female patients. In our series, although it seemed that male patients displayed higher dissatisfaction, which was statistically significant in terms of patient satisfaction level according to gender, such a deduction can not be made due to the inconsistency between the numbers of male and female patients (8 males, 91 female). It was found that 4 male patients (50%) were dissatisfied with HTO, whereas 24 female patients (26%) were dissatisfied.

Our series indicated a survival rate of 83% in 5 years in terms of progression to total knee arthroplasty. However, it was remarkable that the satisfaction level of patients was 71.7% and that the rate of patients who would recommend the surgery to others was 74.7%.

Moreover, it was also important that the mean satisfaction time after the operation was 54.1 months.

In conclusion, although successful results of HTO were reported in many studies, it is seen that evaluation criteria are not sufficient. Even in a series that is accepted to be very successful, considering only an assessment of the rates for total knee arthroplasty, satisfaction levels may not be as high as expected. With regard to this point, objective evaluation methods that focus much more on patient satisfaction and thoughts are needed to assess the results of HTO operations.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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