

FEMUR BAŞI OSTEONEKROZU: VAKUM DRENLİ VE VAKUM DRENSİZ KOR DEKOMPRESYON SONUÇLARI

Osteonecrosis Of The Femoral Head. Results Of Core Decompression With And Without A Suction Drain

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Özet

Amaç: Bu çalışmanın amacı sadece kor dekompresyon yapılan hastalar ile kor dekompresyondan sonra, açılan tünele vakumlu dren konulan hastaların sonuçlarını karşılaştırmaktır.

Yöntem ve Gereç: 25 hastanın 39 kalçası iki eşit gruba bölündü. Birinci gruba (n=19) sadece kor dekompresyon, ikinci gruba (n=20) ise kor dekompresyondan sonra açılan tünele vakumlu dren konuldu. İki grup arasındaki fark klinik olarak karşılaştırıldı. Klinik olarak Harris kalça skorlaması kullanıldı. İki grubu karşılaştırmak için Mann-Whitney U testi uygulandı.

Bulgular: Altıncı ayda, Harris kalça skorlaması ile hastalar karşılaştırıldığında iki grup arasında anlamlı fark bulunamadı. Fakat gruplar kendi içinde karşılaştırıldığında kor dekompresyonun sonuçları önemli ölçüde iyileştirdiği gözlenmiştir.

Sonuç: Erken evre osteonekrozun tedavisinde kor dekompresyon Harris kalça skorunu önemli ölçüde iyileştirmiştir fakat kor dekompresyon ile açılan tünele vakumlu dren konulmasının, sonuç üzerine herhangi bir etkisi olmadığı gözlenmiştir.

Anahtar kelimeler; Femur başı osteonekrozu; Kor dekompresyon; Kalça

Abstract

Objectives: The aim of this study is to compare the clinical outcomes of the femoral head osteonecrosis treated with core decompression (CD) combined with a suction drain into the core tract versus simple CD.

Materials and Methods: Thirty-nine osteonecrotic hips in 25 patients were divided into 2 groups. Patients in group 1 (19 hips) were treated with CD, and those in group 2 (20 hips) received suction drain into the core tract after CD. Outcome between the 2 groups were compared clinically. Clinical assessments included assessment Harris hip score (HHS). Difference in HHS between the two groups were calculated using the Mann-Whitney U test.

Results: At the end 6 months, patients compared with HHS. No significant differences were found between the two groups, but there was significant statical difference within the groups.

Conclusions: Treatment of the early stage of osteonecrosis of the femoral head with CD improved the HHS but combined with the a suction drain into the core tract after CD seems to be not better than simple CD.

Keywords: Osteonecrosis of the femoral head, Core decompression, Hip

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Introduction

The purpose of this study was to assess the results of core decompression (CD) combined with a suction drain into the core tract after CD versus simple CD. Avascular necrosis is defined as cell death in both components of bone. This condition occurs mainly in adults between 30 and 60 years of age. The treatment is mainly surgical. The lack of circulation in bone will result in osteonecrosis, which mostly happens in the weight bearing area, at the anterosuperior sight of the femoral head (1). If the necrosis stimulated bone regeneration is slower than bone resorption, it may progress to collapse of the bone and cartilage and lead to hip arthroplasty (2,3). Therefore, avoiding the progression of osteonecrosis and even promoting the lesion healing have been critical for clinical treatment. Treatment of the osteonecrosis in femoral head can be divided to non surgical and surgical treatments. Non surgical treatment is to slow the advancement of the disease and preserve the joint from hip arthroplasty. These nonsurgical treatments include drug therapy, hyperbaric oxygen, electrical stimulation, extracorporeal shock wave, and pulsed electromagnetic field (3-8). In general, CD is the most successful treatment for osteonecrosis of the femoral head at early stage of the femoral head osteonecrosis (9,10). The fracture of the subchondral bone, the articular cartilage collapse, and ultimately the osteoarthrosis of the hip joint are radiographic characteristics that show the process of this disease. The outcome of CD is not always satisfactory because the reconstruction of the necrotic area by this procedure may remain incomplete owing to insufficient creeping substitution and bone remodeling (11). Some authors have combined CD with electrical stimulation or growth factors (12-15). Other studies have reported vascularized or nonvascularized bone grafting (16-18). In this paper, we hypothesize that to put a suction drain into the core tract can improve the results in patients with atraumatic osteonecrosis of the femoral head.

Materials And Methods

After the study was approved by our local ethics committee and informed consent was obtained from all participants. Thirtynine osteonecrotic hips in 25 patients were randomly divided into 2 groups. Patients in group 1 (18 hips) were treated with CD, and those in group 2 (18 hips) received suction drain into the core tract after CD (Figure 1). Outcome between the 2 groups were compared. The effectiveness was determined by comparing the postoperative outcome regarding change in Harris hip scores (HHS), and the need for total hip arthroplasty. The cases were included according to the following criteria: No malignancies, no history of trauma, radiographic criteria of Ficat stage I–II without collapse of the femoral

head. The exclusion criteria for this study were as follows: traumatic hip fracture in patient history, radiographic criteria of Ficat stage III–IV with collapsed femoral head. Each patient failed a conservative therapy (physiotherapy, drug therapy). The demographics for two groups were similar regarding age, gender, and etiology of the osteonecrosis. Patients were staged according to Ficat classification. At the beginning of the study 26 hips were classified as stage I and 13 as stage II. Pretreatment evaluation consisted of a complete history, physical examination, MRI and radiographs of the affected hips (Figure 2). Follow-up examinations were scheduled at 3 and 6 months. Patients with bilateral osteonecrosis of the femoral head were not operated simultaneously due to the partial weight bearing postoperatively, therefore, a second operation on the other hip was performed within 3–6 months after the first operation. There were 30 male and 9 female patients, with a median age of 44 (64–36) years. There were 22 patients without risk factors, therefore classified as idiopathic osteonecrosis. In the remaining patients, identified risk factors were alcohol abuse and previous corticosteroid usage. CD was performed by one surgeon as described by Steinberg et al with a 9.5 mm drill using image intensification (Figure 3). A cortical window was made below the greater trochanteric ridge and the device directed into the anterosuperior portion of the femoral head and the bone was drilled until the tip reached within 5 mm of the subchondral area. After 6 weeks, the partial weight bearing was continuously increased to achieve full body weight within 12 postoperative weeks. We used SPSS version 13.0 software (SPSS Inc, Chicago, IL) for all analyses. Differences in HHS between the two groups were calculated using the Mann-Whitney U test. Categorical variables is calculated with Fisher's Exact Test and Chi-Square test. Wilcoxon Signed Ranks Test is used to investigate the difference within the groups. A P value < 0.05 was considered to be statistically significant.



Figure 1:Core decompression; combined with the a suction drain into the core tract (Arrow).

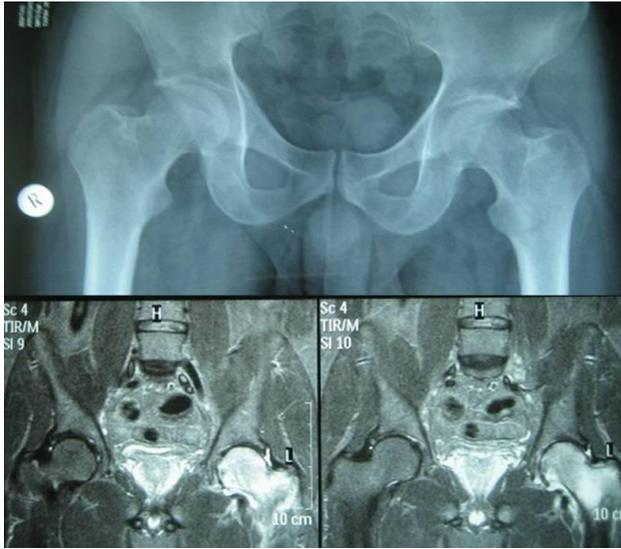


Figure 2: Radiograph and MRI of the affected hip.



Figure 3: Drilling of the femoral head with 9.5 mm drill bit using image intensification.

Results

The two groups were statistically comparable regarding age, gender, lesion stages. The patients were followed for an average period of 6 months after surgery. There was no difference in two groups between baseline HHS. Median HHS in group 1 was 75 (65-87) preoperatively, and 87 (70-93) at the end of 6 months postoperatively. In group 2 HHS was 73 (65-87) preoperatively, and 88 (70-93) postoperatively at the end of 6 months. Difference in HHS (pain, function, deformity, and motion) was observed between these 2 groups at the

end of 6 months, but this was not statistically significant ($P=0.84$). There was statistically significant difference within the groups regarding HHS measured at 6 months later after CD ($P=0.001$). Patients required total hip arthroplasty in two groups were same ($P=0.66$). Also there were no differences in major or minor complications between the two groups.

Discussion

Disease staging is typically done with the use of radiographic images. The Ficat and Arlet classification is one of the more commonly used methods (19). CD with or without bone grafting is the most common procedure performed for the early stages of osteonecrosis of the femoral head (20,21). The rationale of CD in the treatment of early stages of osteonecrosis of the femoral head is to reduce or decompress the intraosseous pressure in the femoral head resulting from venous congestion and other pathways, support vascular invasion and facilitate regeneration of the necrotic tissue (22,23). Our hypothesis was that to reduce the pressure in the femoral head by insertion of a suction drain into the core tract after CD. This procedure is simple, and with low morbidity. While core decompression is commonly performed for osteonecrosis of the femoral head, the variations in reported techniques and drilling procedures make it difficult to interpret the efficacy of these procedures. Although improved outcomes have been stated when comparing surgical treatment with conservative nonsurgical treatment, no surgical treatment is universally accepted. The ideal treatment modality must be simple, and with low morbidity and mortality rates. It should not increase the difficulty of a subsequent hip arthroplasty. Ficat reviewed the results of CD in 133 patients with osteonecrosis of the hip (average follow-up, 9 years, 6 months) and stated a successful clinical result in 90% with no radiographic progression in 79% of the patients (24). The failure rate was 6% for stage I hips and 18% for stage II hips. A review by Mont et al. between 1960 and 1993 reported 24 studies with 1,206 hips that were treated with CD. It included studies with favorable as well as unfavorable outcomes (25). Satisfactory clinical results were reported in 63.5% of the hips treated with CD compared with a 22.7% success rate using nonoperative treatment. One of the advantages of CD is that it is a relatively simple surgical procedure. If attention is paid to technical details, the prevalence of complications is low and there is minimal morbidity associated with this procedure. The most common complication is subtrochanteric or intertrochanteric fracture. CD has considerable less morbidity and mortality, however, when compared with total hip arthroplasty in patients with osteonecrosis of the femoral head. Disease stage alone seems to be the best predictor of disease progression after CD. Hungerford studied 204 hips (follow-up, 32-37 months) and reported a 96% (47 of

49) success rate for Ficat stage I, 77% (82%) for stage II, and 60% (39 of 65) for stage III (1). CD has been proven to be suitable for small to centrally located, medium sized defects before collapse of the head. It is suggested to reduce the oedema related intraosseous pressure in order to relieve pain. Additionally, it is suggested that CD induces reperfusion, possibly associated with revascularisation and bone regeneration of the necrotic area. None of these surgical options was found to be superior to any other treatment, as determined by randomized studies, and some of these surgical procedures are technically demanding. The effectiveness of conservative treatment of osteonecrosis of the femoral head is poor; although, Zhao et al. showed that the lesion size in osteonecrosis of the femoral head often decreases slightly over time (26). The current study results cannot be compared with other studies because there is no study like the current study.

The limitation of our study was the number of the participants. If it can be done with more cases the results may be changed.

Conclusion

In conclusion, treatment of the early stage of osteonecrosis of the femoral head with CD is an effective treatment but when combined with the a suction drain into the core tract after CD seems to be not better than simple core decompression but some studies are needed with more cases.

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