



ROLE OF ARTHROSCOPY FOR KNEE OSTEOARTHRITIS

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ABSTRACT

Knee arthroscopic surgery is one of the common minimal invasive techniques performed worldwide. The treatment of knee osteoarthritis by arthroscopy surgery has increased over the last decade. Presently, a lot of focus has been directed towards the role of arthroscopic surgery in osteoarthritis (OA) and in knee degenerative pathology. The arthroscopic surgery applied to treat osteoarthritis (OA) is controversial, although arthroscopy surgery serves as a less invasive and effective option than traditional methods of managing osteoarthritis (OA). Some believe that arthroscopic surgery in the management of osteoarthritis (OA) has no effect but only appropriate in certain situations like selected patients with mild to moderate arthritis; acute onset of symptoms and localized joint pain can be relieved and improve the knee function. Since, irregular surface of joint and debridement from cartilage released into the joint cavity of the knee, the arthroscopic surgery away debridement and smooth irregular surface of joint might help in the improvement of knee function. The aim of this review is to update the efficacy of arthroscopy for knee osteoarthritis.

Keywords: Osteoarthritis; knee; Arthroscopy; Treatment

INTRODUCTION

Osteoarthritis (OA) is characterized by loss of articular cartilage, narrowing joint space and subchondral bone sclerosis that causes pain, effusion and limited movement [1]. According to a report published by the World health organization (WHO), Osteoarthritis (OA) will become the fourth leading cause of disability by the year 2020 [2].2 Osteoarthritis is the major cause of locomotors disability [3]. Knee osteoarthritis is common cause of knee pain in older age or above 50 years of age and associated with global health and economic burden [4]. Arthroscopy is a surgical procedure in which a fiber-optic endoscope which inserted into the joint through a small incision. The surgeon makes second incision to insert surgical instruments to perform surgical procedures for the treatment of various diseases. Many treatment options like use of Analgesics, physical therapy, arthroscopic joint debridement, joint lavage, and joint replacement are available for the management of osteoarthritis (OA) of the knee joint in the correctly selected patients [5]. In 1990, Burks describes the three indications such as, to define pathology, treat focal lesions within the joint and prolong use of the knee with generalized treatments as debridement and abrasion arthroplasty for the use of arthroscopy in the treatment of osteoarthritis (OA) [6]. In patients with knee osteoarthritis (OA), the role of arthroscopic debridement remains much debated. Arthroscopic surgery does not seem to benefit the patients with advanced osteoarthritis (OA) of knee [7]. But benefit greatly in patients with mild to moderate osteoarthritis, meniscus tear and loose bodies. A large number of studies explained that the success rate of arthroscopic debridement was about 70% and inactive older patients having mild to moderate osteoarthritis of knee with failure of conservative treatment, the arthroscopic debridement gives better result [8].

Treatment Modalities for The Osteoarthritic Knee:

Arthroscopy for osteoarthritis (OA) relieves symptoms by removing the debris and inflammatory cytokines that cause synovitis [9, 10], removal of loose bodies and debridement of unstable cartilage. The arthroscopic technique includes lavage, debridement of the knee, arthroscopic partial meniscectomy, abrasion arthroplasty, arthroscopic microfracture.

1. Arthroscopic lavage

Arthroscopic lavage is a procedure in which joint is visualized and irrigated with normal saline or ringer's lactated solution [11]. Hence decreasing the concentrations of the degradative enzyme in the knee and slowing the breaking down of proteoglycans and collagen, maintaining the integrity of the cartilage [12]. The efficacy of the lavage procedure may relieve the extent of disease. In Livesley et al. study, 37 cases of the osteoarthritic knee treated with arthroscopic lavage and physiotherapy were compared³ with control group of 24 knees treated by physiotherapy alone and the lavage group showed more improvement in comparison with control group [13, 14]. The patients with mild radiographic osteoarthritis experienced pain relief more than patients with severe changes. The physiotherapy group had some pain relief which improves in short term. By the one-year follow-up, the patients returned to pretreatment conditions in lavage group [15].

2. Arthroscopic debridement

Arthroscopic debridement is a procedure in which excise damaged parts of articular cartilage, meniscus, synovial membrane or ligament in the joint [16]. Arthroscopic debridement removes torn meniscal fragment and loose cartilage flap [17-19]. The removal of tissue debris improves symptoms reducing the source of irritation of synovial tissue [20]. The term joint debridement was introduced by Magnuson in 1941. He removed hypertrophic synovium, osteophytes, loose bodies, and diseased cartilage to get relief the symptoms of osteoarthritis. Magnuson found complete recovery in 60 of 62 procedures [21]. Baumgaertner et al reported positive results from debridement in patients with symptoms less than one year's duration. They found 72% from good to excellent results in this group compared with the group of patients with symptoms longer than one year's duration. They found 39% of good to excellent results in this group [22]. In one prospective study of arthroscopic debridement procedures showed 75% of patients had good or excellent results [23].

3. Arthroscopic lavage combines with debridement

Some studies have attempted to explain lavage combined with debridement provides more relief for the osteoarthritic knee [24, 25]. In 1986, Jackson et al in a randomized study reported that 65 patients treated with lavage alone and 137 patients treated with lavage and debridement [26]. In the lavage group, 80% of patients showed initial improvement and 45% improvement at three years follow-up. In the patients treated with lavage and debridement, 88% showed initial improvement and 68% maintained improvement at three years follow up [27]. The above results showed that arthroscopic lavage with debridement was effective as compared with individual therapy.

4. Arthroscopic partial meniscectomy

Arthroscopic surgery and partial meniscectomy is an effective treatment option in patients with an acute meniscal injury. Jackson and Rouse were the first to evaluate partial meniscectomy in the older population over the age of 53 years with osteoarthritis (OA) [28]. The report that 95% of knees with no degenerative joint changes with partial meniscectomy which found good to excellent results at 2.5 years of follow-up. In partial meniscectomy with degenerative joint changes were produced 80% good to excellent results over 2.5 years of follow-up. McBride et al. compared the results of arthroscopic partial meniscectomy for a traumatic tear in older patients with degenerative tears and noted 95% satisfaction rate in the group treated with partial meniscectomy for traumatic tear and 65% satisfaction rate was found in a group treated for degenerative meniscal tear at 3 years follow-up [29]. Boe and Hansen et al. studied in 36 patients above 50 years of age with arthroscopic partial meniscectomy. They reported, there was 75% good or excellent result with no difference between patients with and without degenerative joints diseases. They concluded that the result of arthroscopic partial meniscectomy was good enough in the presence of degenerative arthritis [30].

5. Abrasion arthroplasty

The development of abrasion arthroplasty for the treatment of arthroscopic was advanced by Johnson. He reports that 95 patients in the group with an average age of 60 years and with 2 years follow-up shows improvement in 74 patients [31]. He found that intracortical defects created in a sclerotic lesion without

penetration of the subchondral bone uncovered small blood vessels. The bleeding that occurred at the abraded cartilage defect resulted in blood clot attachment to the surface, followed by fibrous metaplasia to fibrocartilage tissue maintained for up to 6 years postoperatively [32]. Rand et al. in his study compared arthroscopic partial meniscectomy with limited debridement and abrasion arthroplasty in patients with osteoarthritis(OA). He showed that abrasion arthroplasty had a minimal benefit over partial meniscectomy vessels [33]. The result of abrasion arthroplasty becomes worse with time due to deterioration of the load-bearing capacity of fibrocartilage [34,35].

6. Microfracture

Arthroscopic microfracture is a surgical procedure under arthroscopy and makes microfracture in the subchondral bone by picking about 3-4 mm deep holes with 3-4 mm bridges between 3-4 hole to bleed and exude fat droplets from the marrow [36]. This is the safe minimally invasive single-stage technique to produces new cartilage [37, 38]. Great care should be taken to avoid the growth plate in younger patients [39]. Steadman et al. indicate the awl include less thermal necrosis of the subchondral bone5 than drilling or abrasion arthroplasty and help in adhesion for the clot. They report a 75% improvement at 3-5 years follow-up [40]. In some studies, showed there were significant symptoms and functional improvement with arthroscopic microfracture [41]. Arthroscopic microfracture stimulates mature fibrocartilage is predominantly type I collagen with only a few amounts of type II collagen [42] that limited the durability of articular cartilage [43].

CONCLUSION

Arthroscopy is a powerful surgical tool, which can provide the surgeon with minimally invasive options to treat knee osteoarthritis. It is safe, simple and with minimal complication and even patients can discharge from hospital within two days of admission. Knee osteoarthritis is a major cause of locomotor disability in elderly patients. The role of arthroscopy in the management of degenerative knee arthritis in older patients is controversial but play active role in early management of degenerative joint diseases. Carefully selected patients with mild to moderate radiographic degenerative changes are considered for arthroscopy to get successful results and minimizing the risk and expense of arthroscopic surgery. Arthroscopy with proper rehabilitation can improve function of knee osteoarthritis. The arthroscopy is useful in the treatment of knee osteoarthritis and it has low complication. Long-term randomizes prospective studies are needed to define the role of arthroscopy further in knee osteoarthritis.

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