

Arthroscopy Joint Lavage and Beck Perforations for the Treatment of Osteoarthritis of the Knee



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Abstract

Introduction: Conditions such as osteoarthritis represent a major health problem and displeasure in our population of older adults. The objective of the work is to evaluate the effectiveness of joint lavage and Beck perforations for painful knee osteoarthritis.

Method: A longitudinal prospective pre-experimental study was carried out for 10 years, the study population consisted of patients with symptomatic osteoarthritis. A non-probabilistic sampling by criteria was used.

Results: The largest number of operated patients belong to the group aged between 60 and 69 years, with obvious improvement in the first year but that decreases over time, two years after surgery, 50% or more report feeling well.

Conclusion: Surgery for osteoarthritis in the knee through simple procedures can be performed and improve the quality of life of the elderly, with satisfactory results in a limited time.

Keywords: Osteoarthritis; Knee osteoarthritis; Joint lavage; Beck perforations

Introduction

Social, scientific and technological advances have raised life expectancy, Cuba is an example of a country that shows a significant aging of its population, it is expected that by 2050 Cubans will enjoy one of the highest average age on the planet. Conditions such as osteoarthritis represent a major health problem and displeasure in our population of older adults.

According to the American College of Rheumatology, osteoarthritis can be defined as a heterogeneous group of conditions that lead to joint symptoms and signs that are associated with defects in the integrity of the articular cartilage, as well as changes related to the subchondral bone and joint margins [1]. It constitutes the most important cause of functional disability of the musculoskeletal system in all races and geographical areas. It affects 9.6% of men and 18% of women over 60 years of age. In Western countries this represents the fourth place in the health problems of women and the eighth in men. It is an anatomico-clinical

syndrome characterized by mechanical pain and frequently evolves associated with stiffness with effusion [2,3]. Currently, the joint is considered as a single organ, a functional unit made up of different tissues, mainly cartilage, synovial membrane and subchondral bone, all of them implicated in the etiopathogenesis of osteoarthritis, which presents three fundamental manifestations: synovitis, destruction of the cartilage and alterations in the subchondral bone (bone remodeling with subchondral sclerosis, osteophytes and focal osteonecrosis).

90% of orthopedic consultations are due to osteomyoarticular pain, 60% of which are due to osteoarthritis, the knee joint being the most affected by this cause. At the "Mártires del 9 de Abril" Provincial General University Hospital, in the province of Villa Clara, several studies have been carried out on the evaluation of the results of surgical interventions on arthritic knees [4-7].

The results obtained with this research will serve as a source of information for future research on the subject and will

contribute to raising the level of knowledge of residents and specialists who work in health services. What would be the results obtained through the surgical technique of joint lavage without arthroscopy and Beck Perforations for pain relief in patients with painful osteoarthritis of the knee at the Martires del 9 de Abril Provincial Hospital in Sagua la Grande in the period between from January 2010 to December 2020?

As the main objective of the work we intend to evaluate the effectiveness of the surgical technique for painful osteoarthritis of the knee in patients treated at the General Provincial University Hospital "Mártires del 9 de Abril" of Sagua la Grande in the period from January 2010 to December of 2020.

Method

A longitudinal prospective pre-experimental study was carried out for 10 years, the study population consisted of patients with symptomatic osteoarthritis. A non-probabilistic sampling by criteria was used. We used theoretical and empirical research methods. The research was carried out for a period of 10 years between January 2009 and December 2019, in the orthopedics and traumatology service of the Martires del 9 de Abril General Provincial University Hospital in Villa Clara. The study population was made up of patients who met the following diagnostic criteria: grade 2 and grade 3 classification, with limited or no response to conservative treatment, presence of symptoms

(pain) and mechanical signs.

Patients with previous joint surgery were excluded, those who presented objective joint instability and decreased muscle strength, varus angular deformities greater than seven degrees and valgus of 12 degrees, secondary knee osteoarthritis and the presence of chronic non-communicable diseases that prevented rehabilitation. and those patients who could not be evaluated for any reason. All these data were captured in a data collection and search model and non-parametric tests of statistical significance were applied; the Windows 2010® Excel program was used. All the patients who participated filled out the informed consent.

Results

Table 1 shows the characteristics of the cases in the sample with respect to their age and sex, we found that older adults between 60 and 69 years of age are operated on more frequently, 30 knees representing 55.5%, it is frequent that patients at this age are more active and therefore decide to improve their physical condition through surgery. Pain is the main symptom suffered by patients suffering from grade 2 or grade 3 osteoarthritis, its evaluation carried out in an outpatient clinic three months after the operation, six months after the intervention and one year, thanks to the Eva Scale, It can be seen how in both groups according to the classification at the third month there is significant pain relief, but as time passes the improvement declines (Table 2).

Table 1: Characteristics of the cases.

Age group	Sex				Total N° (%)
	Female		Male		
	Right knee	Left knee	Right knee	Left knee	
60-69 years	7	6	9	8	30 (55,5%)
70-79 years	4	3	5	3	15(27,8%)
80 moreyears	2	2	3	2	9(16,7%)
Total	13	11	17	13	54(100)

Source: Database.

Table 2: Results on pain after three, six months and one year of postoperative evolution.

Classification	Escala EVA			
	Initially	Three months	Six months	One year
grade 2 osteoarthritis	7,1	3,1	3,7	4,1
grade 3 osteoarthritis	7,4	3,5	4,3	4,6

Source: Database.

Table 3 evaluates the result after two years of surgery on the patient, they are well, -according to what they report- more than 50% of the operated cases, regarding pain relief, mobility and functionality of the joint, however, 20.4% of the operated patients

report feeling worse regarding joint functionality after two years of surgery. Regarding pain relief, at two years 76% of the patients report feeling good or improved, joint mobility, according to 31.5%, is the same or worse than at the start of treatment.

Table 3: Results with the technique used two years after the intervention regarding their clinical situation.

clinical situation	Result after two years			
	Good	Worse	Samed	Improve
	N° (%)	N° (%)	N° (%)	N° (%)
Pain relief	32 (59,3)	9 (16,7)	6 (11,1)	7 (12,9)
Improved joint mobility	27 (50,0)	10 (18,5)	8 (14,8)	9 (16,7)
Global joint functionality	31 (57,4)	7 (12,9)	5 (9,3)	11 (20,4)

Source: Database.

Discussion

Osteoarthritis is a degenerative joint process that occurs as a consequence of mechanical and biological disorders that destabilize the balance between the synthesis and degradation of articular cartilage, stimulating the growth of subchondral bone and with the presence of chronic synovitis of mild intensity [8]. The search and use of methods that allow alleviating symptoms, especially pain, is a constant for medical treatment, physiotherapy and rehabilitation, acupuncture and ozone therapy have been used [9,10].

Treatment modalities range from conservative to surgical, depending on the classification of the lesion; however, there is a group of patients who do not undergo arthroplasty for one reason or another, including lack of consent. by the patient and the difficulty in accessing this costly procedure through our service. Hence, there is a group of older adult patients located among those who do not respond adequately to conservative treatment and for whom it is not possible to place a total knee prosthesis as definitive treatment for whom it is necessary to alleviate pain, since it disrupts their quality of life and their mental health [11].

In the author’s opinion, for the indication of surgical treatment, there is the subjective influence of the patient (pain) and the subjective opinion of the doctor to determine treatment, this situation of high variability -this appears when there is no scientific evidence on reliable results, ignorance of techniques reliable and/or lack of agreed protocols on the procedures to be performed. Regarding the prevalence of osteoarthritis in the knee, it occupies 60% in the male sex and 90% in the female sex who die between the ages of 60 and 70. In the United States, the annual incidence rate for this pathology is 240 per 100,000 inhabitants [12].

In Cuba, the prevalence verified for this condition was 20.41% (CI 19.02-21.87). Approximately 17% - 19% in the urban population and between 21% - 23% of the rural population. From the etiological point of view, it is related to genetic elements, associated with epidemiological studies that estimate the possibility of being inherited at 65% [13].

In osteoarthritis, there is a decrease in the number of chondrocytes, a cellular element of cartilage tissue, mainly due

to apoptosis, in which different cellular mediators present in excess in the affected joint would be involved, such as nitric oxide (NO), interleukin 1- beta (IL-1b) and tumor necrosis factor alpha (TNFa). NO, a gaseous free radical produced by the chondrocyte in response to the stimulation of different catabolic factors, inhibits chondrocyte proliferation and collagen synthesis, induces cell death, and increases the damaging capacity of other oxidants. On the other hand, the three mediators can activate a series of proteolytic enzymes from the group of proteases, mainly cysteine proteases and metalloproteases such as collagenase, which contribute to the degradation of the extracellular matrix of cartilage, causing its cracking and progressive destruction.

In osteoarthritis there is a component of inflammation of the synovial membrane (hyperplasia and infiltration of mononuclear cells) that manifests itself in the form of swelling, heat and local redness, which has been related to its chronicity and progression. Joint mechanical overload (high frequency and intensity mechanical loads), the presence of micro-crystals and different products from cartilage degradation have been proposed as triggering factors for this inflammatory response. During the inflammatory process, the synthesis of biochemical mediators by the synovial membrane has a catabolic effect on the cartilage and, in turn, stimulates the production of other mediators by the chondrocyte, pro-inflammatory molecules, with a marked destructive effect on the cartilage. cartilage. On the other hand, NO is also found in high concentrations in the synovial fluid and in the synoviocytes of the affected joint. This is where the authors’ proposal has its support, by performing joint lavage, the joint is freed from these substances that can continue to damage or cause pain.

The use of joint lavage in osteoarthritis has been limited mainly to the treatment of osteoarthritis of the knee, and there are several known mechanisms through which joint lavage can be beneficial in the treatment of patients with gonarthrosis, firstly evacuation of cartilaginous detritus, the evacuation of micro-crystals, the dilution of degrading enzymes and cytokines involved in chondrolysis, as well as joint cooling, capsular distension and the rupture of intra-articular adhesions. A careful assessment of the data provided in the literature on the contribution of each of these mechanisms to the improvement of patients with

gonarthrosis is necessary, since it depends very much on the clinical characteristics of the patients, as well as on the lavage technique.

At the General Hospital of Mexicali, TerrazasLópez uses two intra-articular treatment modalities for grade II and grade III gonarthrosis, with satisfactory results [14]. In osteoarthritis, the subchondral bone presents mineralization defects, growth of the subchondral bone tissue and the appearance of osteophytes. These changes may even precede those that occur in the cartilage and synovium, and are promoted by different mediators produced by the osteoblast and by alterations that produce greater bone resorption.

Hyperpressure in the subchondral bone produces damage to the vascular supply, increased cell activity, and sclerosis. All this is associated with the growth of marginal osteophytes that normally arise in the periarticular fibrocartilage, fusing later with the bone, and the formation of necrotic cystic areas in the bone "bone cysts" also occurs. Once again, the authors consider that the proposal to perform Beck perforations acts on the pathophysiology of osteoarthritis, decreases the pressure of the metaphyseal compartment, improves vascularity and increases bone neopharman.

Diagnosing osteoarthritis does not have the same objective as defining and treating it, for this we use its radiological grades, according to Kellgren and Lawrence in their work, from grade zero - absence of osteophytes - going through grade 1 with doubtful osteophytes, grade 2 (mild) where minimal osteophytes appear, possibly with joint impingement, cysts and sclerosis, grade 3 (moderate) with moderate or clear osteophytes, moderate joint impingement of the joint line and major grade 4 (severe) with severe osteophytosis, garndes osteophytes and clear joint impingement. Osteoarthritis is considered for epidemiological studies those cases that suffer a grade 2 or more lesion. In this group of patients, arthroscopy occupies an important place, as it is a fast, available, ambulatory, effective procedure with a very low rate of complications [15,16].

In the western part of the country, Cordero et al. use arthroscopic joint lavage, to which they add PRP and ostectomy to the fibula in knees with varus angular deformity [17]. The American College of Rheumatology has published guidelines for the treatment of osteoarthritis of the knee, including non-pharmacological measures, pharmacological measures and invasive treatments. In 1995, the action guide for the treatment of knee osteoarthritis of the ACR recommended the use of joint lavage as a measure to be used in patients with osteoarthritis of the knee who did not respond to the administered treatment, both pharmacological and non-pharmacological. Current treatment options for articular cartilage lesions and osteoarthritis aim to relieve inflammation and pain, but have no effect on the natural progression of the disease, which is why there is a need to investigate new treatments. Improvements in the use of

cell therapies have given rise to a generation of new possible treatments.

Conclusion

Surgery for osteoarthritis in the knee through simple procedures, such as joint lavage without arthroscopy and Beck perforations, can perform and improve the quality of life of the elderly, with satisfactory results in a limited time. Pain decreases rapidly after surgery, but behind the clinical conditions do not improve much, later in the course of time up to 50% may present pain again.

References

1. Woolf AD, Pheger B (2003) Burden of major musculoskeletal conditions. *Bull World Health Organ* 81(9): 646-56.
2. Nguyen-Pham T, Alvarez-Lopez A (2020) Arthroscopy and simultaneous partial fibulectomy in patients with gonarthrosis and varus deformity. *AMC* 24(2): 8.
3. Smith HJ, Richardson JB, Tennart A (2019) Modification and validation of the Lysholm Knee Scale to assess articular cartilage damage. *Osteoarthritis Cartilage* 17(1): 53-58.
4. Morales Pineiro S, Lennox Warner D, Mata Cuevas R, Morera Estevez L (2016) Value of arthroscopy in the elderly. *Medicent Electron* 20(1): 27-37.
5. Dominguez Plain L, Plain Pazos C, Morales Pineiro S, Cedre Gonzalez JC, Perez de Alejo Plain A (2020) Osteoarthritis of the knee: Threat to quality of life. *Biomed J Sci& Tech Res* 27(4): 20972-20973.v
6. Cedre Gonzalez JC, Dominguez Plain L, Plain Pazos C, Morales Pineiro S, Perez de Alejo Plain A, et al. (2020) Fibula ostectomy as palliative treatment of knee osteoarthritis. *Edel J Biomed Res Rev* 2(1): 36-37.
7. Dominguez Plain L, Plain Pazos C, Morales Pineiro S, Cedre Gonzalez JC, Perez de Alejo Plain A, et al. (2020) Knee osteoarthritis: Conservative or surgical treatment?. *Orto and Rheum Open Access* 17(1): 1-3.
8. Mas Garriga X (2014) Definition, etiopathogenesis, classification and forms of presentation. *Atten Elementary* 46 Suppl 1:3-10.
9. Diaz Tamayo M, Gordo Gomez YM, Dupotey Hernandez DR (2020) Benefits of physical rehabilitation in older adults with gonarthrosis. *ActionN16*: 1-10.
10. Collado Campos M (2018) Bioregulatory ozone-medicine integrative therapy for gonarthrosis in octogenarians. *Spanish Journal of Ozone Therapy* 8(1): 153-164.
11. Rodriguez-Borlado Diaz B, Sanz-Rosa D, Sanz Pozo B, Llisterri Caro JL, Herrero Barbero M (2022) Pain, quality of life and mental health in patients with knee pain from gonarthrosis: case-control study. *Semergen: Spanish journal of family medicine* 48(1): 45-53.
12. Quintero TR (2010) Etiology and pathophysiology of osteoarthritis. In: Quintero, Monfort, Mitrovic. *Osteoarthritis: Biology, physiopathology, clinic and treatment* Madrid: Editorial Medica Panamericana.
13. Rignack-Ramirez L, Brizuela-Arias L, Reyes-Llerena G, Guibert-Toledano Z, Hernandez-Cuellar I (2020) Preliminary study of patients diagnosed with osteoarthritis in the outpatient service of the Rheumatology Center. *Rev Cuba Reumatol* 15(3): 8.
14. Terrazas Lopez RA (2019) Pilot intervention study with two modalities of intra-articular treatment in grade II and III gonarthrosis in patients from the ISSSTE hospital and the General Hospital of Mexicali in 2015-2016.

15. Hunter DJ, Bierma-Zeinstra S (2019) Osteoarthritis. *Lancet* 393(10182): 1745-1759.
16. Alvarez Lopez A, Soto-Carrasco SR, Fuentes-Vejar R, Garcia Lorenzo YC (2022) Knee arthroscopy in patients older than 64 years with primary gonarthrosis. *Cuban Magazine of Orthopedics and Traumatology* 36(1): e449.
17. Cordero-Betancourt LL, Reyes-Chirino G, Martinez-Couce I, Valdes-Camalleri JA, Blanco-Cabrera RC, et al. (2022) Arthroscopic treatment, fibula ostectomy and platelet lysation in gonarthrosis and varus deformity. *Rev Medical Sciences* 26(2): e5417.



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