



Surgical Interventions for Meniscal Pathology in Middle-aged and Older Adults in Chile

Intervenciones quirúrgicas por patología meniscal en adultos de edad media y adultos mayores en Chile

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Rev Chil Ortop Traumatol 2023;64(1):e17–e22.

Abstract

Objective To descriptively analyze surgical interventions performed in Chile in middle-aged and older adults with meniscal pathology between 2016 and 2018, including the type of healthcare system as an important factor.

Materials and Methods We performed a descriptive analysis of the hospital discharges database of the Chilean Ministry of Health between 2016 and 2018. The cases were selected according to the diagnostic discharge codes of the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10), which were crossed with surgical intervention codes of the Chilean National Health Fund (Fondo Nacional de Salud, FONASA, in Spanish) regarding meniscectomy.

Results A total of 21,424 interventions in 139 medical facilities were performed during the period analyzed. In 51.3% of the cases, the procedures were performed in middle-aged adults (10,983 cases). Older adults underwent 2,254 interventions (10.5%), and both groups encompass 61.8% of all observed cases. The patients who underwent arthroscopic partial meniscectomy (APM) using diagnosis-related payment (*pago asociado a un diagnóstico*, PAD, in Spanish) were significantly older ($p < 0.01$). The 3 medical facilities that with the highest rates of surgeries performed are all private centers that offer the PAD modality and concentrate 26% of all cases.

Discussion In Chile, most meniscal surgeries are performed in patients in age groups that the literature considers to be controversial. Although many possible explanations exist, we deem this fact important for public health, considering that FONASA, which covers most patients in the Chilean public system, is capable of financing a large part of the surgery through the PAD modality.

Conclusions Meniscal surgeries in Chile are mostly performed in patients in the age group in which their usefulness is most questionable.

Level of evidence IV.

Keywords

- ▶ knee arthroscopic surgery
- ▶ meniscus
- ▶ meniscectomy
- ▶ osteoarthritis

received
February 19, 2022
accepted
October 31, 2022

DOI <https://doi.org/10.1055/s-0043-1768240>.
ISSN 0716-4548.

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Thieme Revinter Publicações Ltda., Rua do Matoso 170, Rio de Janeiro, RJ, CEP 20270-135, Brazil

Resumen

Objetivo Hacer un análisis descriptivo de las intervenciones quirúrgicas por patología meniscal realizadas en Chile en adultos de edad media y mayores, entre los años 2016 y 2018, considerando la previsión como un factor relevante.

Método Realizamos un análisis descriptivo de la base de datos de egresos hospitalarios del Ministerio de Salud entre 2016 y 2018, según los códigos de la Clasificación Internacional de Enfermedades, 10.^a edición (CIE-10), que fueron cruzados con los códigos de intervenciones quirúrgicas del Fondo Nacional de Salud (Fonasa) para menisectomías.

Resultados Se analizaron 21.424 procedimientos en 139 centros. El 51,3% (10.983 casos) del total de casos se concentró en el grupo de edad media. El grupo de adultos mayores registró el 10,5% (2.254 casos), sumando ambos grupos el 61,8% del total de casos. Los pacientes sometidos a menisectomía parcial artroscópica (MPA) bajo la modalidad de pago asociado a un diagnóstico (PAD) resultaron ser significativamente mayores ($p < 0,01$). Las 3 instituciones que lideran la estadística son centros privados con convenio PAD, que concentran el 26% de los casos.

Discusión En Chile, la mayoría de las cirugías meniscales se observan específicamente en el grupo etario en que la evidencia sugiere que la utilidad de este procedimiento es más discutible. Aunque las explicaciones pueden ser variadas, consideramos importante el reconocimiento de este fenómeno, teniendo en cuenta que Fonasa, que abarca la mayoría de las pacientes del sistema público chileno, es capaz de financiar gran parte de la cirugía a través de la modalidad PAD.

Conclusión Las cirugías meniscales en Chile se concentran en el grupo etario en que su utilidad es más discutible.

Nivel de evidencia IV.

Palabras clave

- ▶ artroscopía de rodilla
- ▶ menisco
- ▶ menisectomía
- ▶ artrosis de rodilla

Introduction

Degenerative meniscal injury is defined as an atraumatic injury (or with a low-energy mechanism), usually located in the body or posterior horn of the meniscus, with the medial meniscus being the most frequently affected.^{1,2} These lesions can present multiple features with complex patterns, radial middle-third lesions, posterior root lesions, posterior horn lesions, or unstable flaps.²

Several studies¹⁻⁴ have reported that the incidence of this pathology increases with age. It is estimated that more than a third of people over 50 years of age, without radiological evidence of osteoarthritis, present a meniscal lesion that can be seen on magnetic resonance imaging (MRI), with this figure doubling in patients with osteoarthritic changes.

Thus, meniscal injuries correspond to one of the most frequent diagnoses in the trauma clinical practice.⁵ Arthroscopic partial meniscectomy (APM) is also the surgical procedure most frequently performed by specialists in the area, and it is also observed, in various reports,⁶⁻⁹ that its indication for surgery continues to increase, highlighting that up to 75% of these are performed in patients over 40 years of age.

However, there is currently little support in the literature to suggest that symptoms in middle-aged and elderly patients are exclusively attributable to degenerative meniscal

lesions and not to global degenerative processes of the joint. More importantly, the evidence in favor of the surgical treatment in middle-aged and older adults with degenerative meniscal pathology is even more limited. Thus, there is a gap between the available evidence and the current clinical practice.¹⁰⁻¹³

Chile has a mixed health system, combining a public system, called the National Health Fund (Fondo Nacional de Salud, FONASA, in Spanish) and a private system. In total, 80% of the population is currently registered with FONASA, in which the access to health services is conditional on the users' address. In this context, within FONASA, patients have access to elective modalities and programs with specific benefits offered, such as the diagnosis-related payment (*pago asociado a un diagnóstico*, PAD, in Spanish) by private providers, which includes a fixed package of benefits for the surgical resolution of certain pathologies, for which the state can finance up to 92.5% of the surgery in the form of copayments and loans.¹⁴ Thus, in the era of value-based traumatology and particularly in a health system such as Chile's, it is critical to quantify the procedures that could be considered of "low therapeutic value".

The objective of the present work is to describe the statistics of the interventions for meniscal pathology in middle-aged and older adults in Chile, considering the type of healthcare system as a relevant factor.

Materials and Methods

We designed an observational cross-sectional study using the hospital discharge database of the Chilean Ministry of Health between 2016 and 2018. We collected all patients with hospital discharges that corresponded to meniscal pathology (codes M23.0/1-2-3 on the International Statistical Classification of Diseases and Related Health Problems, 10th Revision [ICD-10]) who had undergone surgery (FONASA codes: 2104158, 2104159, and 2501053) in 139 centers in the country.

We included all patients who met the diagnosis and procedure codes, and divided them into groups according to age range for the purposes of analysis: young adults (15 to 44 years), middle-aged adults (45 to 64 years), older adults (65 to 79 years), and octogenarians (≥ 80 years). Patients under 15 years of age were excluded from the analysis.

We performed a descriptive analysis by age group and type of healthcare system, and we also analyzed the associations regarding these variables and their relationship with the PAD program and the hospital centers collected.

For the statistical analysis, we used the IBM SPSS Statistics for Windows (IBM Corp., Armonk, NY, United States) software, version 26.0, and values of $p < 0.05$ were considered statistically significant. The present study did not require informed consent since publicly available and anonymized databases were used.

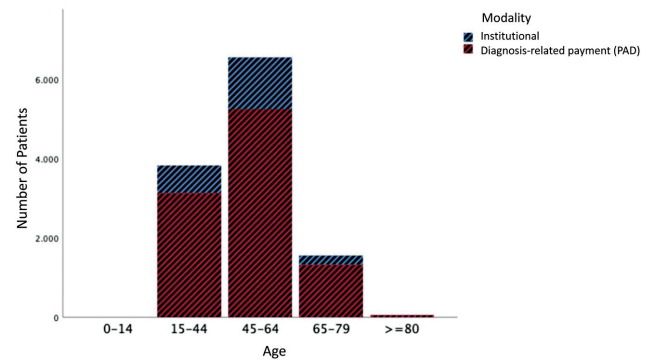


Fig. 1 FONASA patient's surgical modality by age.

Results

We collected data on a total of 21,424 patients; their mean age was of 47.5 ± 14.7 years, 59.7% (12,783) of them were male subjects, and 51.3% (10,983 cases) of the total of cases were concentrated in the middle-age group. The group of older adults comprised 2,254 cases (10.5%), with both groups forming 61.8% of the total. Regarding the type of healthcare system, 56% (11,997) of the patients were covered by FONASA, 81.3% (9,754) of whom had their cases resolved under the elective PAD program (**► Table 1**).

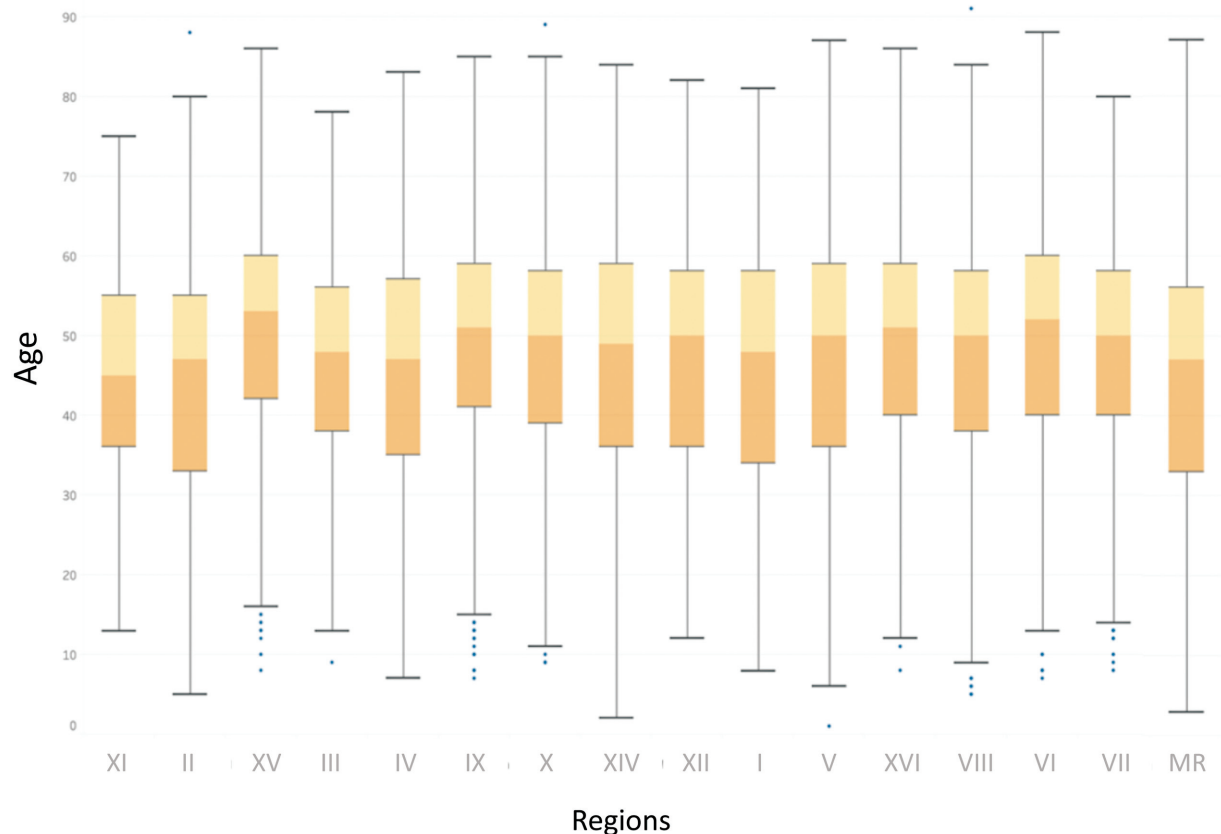


Fig. 2 PAD Meniscal surgery distribution by age throughout the different regions in Chile.

Table 1 Characteristics of the study sample

Variable	Category	Subcategory	15-44 years	45-64 years	65-79 years	≥ 80 years	Subtotal	Total
Sex	Male (n)	–	6,070	5,782	901	30	12,783	21,424
	Female (n)	–	2,025	5,201	1,353	62	8,641	
Healthcare system	Fondo Nacional de Salud (Public Health System) (n)	Total	3,831	6,555	1,552	59	–	11,997
		Institutional	701	1,304	232	9	2,246	
		Diagnosis-related payment (PAD)	3,130	5,251	1,320	50	9,751	
	Intitución de Salud Previsional (Private Health System) (n)	–	4,264	4,428	702	33	–	9,427

When comparing these patients with the group aged between 15 and 44 years, we observe that the proportion of FONASA patients increases significantly, from 47.3% (3831) to 59.6% (6,555) in the middle-age group ($p < 0.01$), and to 68.9% (1,552) in the older adult group ($p < 0.01$). On the other hand, when analyzing the procedures carried out under the PAD program, we observed that the patients who were PAD users were significantly older than the patients operated under other modalities ($p < 0.01$) (→ Fig. 1), without affecting the distribution in terms of age throughout the different regions of Chile (→ Fig.2).

Considering only the group of elderly patients, the 3 institutions that lead the statistics regarding the number of procedures are private centers with a PAD program, which account for 26% of the cases operated on in the country in this age group. The percentage of older adults covered by FONASA in these centers ranges from 52% to 94%. Three public hospitals and seven private clinics with PAD programs are the ten centers that lead in national volume of APMs performed in older adults.

Discussion

The most relevant finding of the present study is the high rate of APMs performed in patients over 45 years of age in Chile, most of whom are covered by FONASA and undergo surgery under the PAD modality. At a time when evidence-based medicine is fundamental to establish public policies, the recognition of this phenomenon seems to be relevant.

Multiple randomized clinical trials^{12,13,15-23} have revealed that arthroscopic meniscal surgery provides little or no benefit when compared to the nonsurgical treatment or sham (placebo) surgery. Furthermore, they^{12,15-18,24,25} have failed to demonstrate significant clinical improvement in favor of APM when compared to the conservative treatment in these age groups.

Short- and long-term follow-up studies^{12,15,18,26} have shown that exercise therapy improves function and the level of activity in patients with degenerative meniscal injuries, regardless of whether they have undergone surgery or not.

In this context, it is possible that the symptoms of these patients are caused not only by a degenerative lesion in the

meniscus, but rather by multiple factors related to early osteoarthritis.¹⁰ Therefore, the poor results, or the short period during which the observed improvements occur, can be attributed to a global joint process.

To our knowledge, only one randomized study, by Gauffin et al.¹¹ among the many works available in the literature, has shown results in favor of the surgical treatment. However, this study seems to be the weakest among them,^{11-13,15,16,21,27} with poor diagnostic confirmation and just a short follow up. In this sense, it seems to be insufficient to support hundreds of interventions carried out annually, especially when compared to the weight of the rest of the available evidence.

On the other hand, the experience of the clinicians and their ability to predict the results as a justification for this intervention seems to be an element of little value. In 2020, Van de Graaf et al.²⁸ evaluated the ability of 194 surgeons to predict the results of 20 patients older than 45 years treated for symptomatic meniscal injury with 2 years of follow-up. They²⁸ observed that only in about 50% of the cases the surgeons were able to correctly predict the evolution of the selected treatment regardless of their level of experience.

The current recommendation, based on an international consensus and the available evidence, is that APM should be considered in patients in whom an adequate period of non-surgical treatment has failed.^{10,29,30} In turn, it could be recommended in patients with an “unstable” pattern of meniscal tear visible on MRI that corresponds to mechanical symptoms.^{10,29} However, the latter has also been a topic of discussion in recent times.^{11,27,31}

Despite the aforementioned, it is striking that in Chile most surgeries for meniscal pathology are performed specifically in the age group in which its usefulness is more debatable, even more so considering that this phenomenon has been declining in many countries recently, which the authors partly attribute to the publication of national and international guides.^{32,33}

We consider it important to highlight that the present is the first study in Chile that aims to provide an estimate of this phenomenon. Although the study covers all the registered surgeries, as it is a registry-based study, it presents limitations typical of these types of study, such as the possibility of

presenting errors in the estimation due to potential problems in the coding of the interventions or diagnoses. In addition, the database used does not enable us to know how many of the patients who underwent APM previously complied with an appropriate period of medical treatment, neither their long-term results.

Despite the cost-effectiveness that arthroscopy could present in the short term, it would be useful in the future to carry out an analysis that includes both direct and indirect costs to determine the real contribution of this intervention.

Although it is still a controversial issue in the literature, recent evidence has helped to highlight the real role of the surgical management and the relevance of the appropriate conservative management as the main therapeutic strategy in this population. We believe there is a need to reach an agreement, adapted to the local reality, on how to stratify and treat patients with this type of injury.

Conclusion

In recent years, meniscal surgeries in Chile have been concentrated in the age group in which its usefulness is most questionable. Based on the available evidence, it seems pertinent to reach a consensus regarding the management of this pathology based on solid evidence, understanding the limitations of the Chilean healthcare system in order to provide direct benefits for the patients who are treated there.

Funding

The present research did not receive any specific grants from the public, private or not-for-profit sectors.

Conflict of Interests

The authors have no conflict of interests to declare.

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