RESEARCH ARTICLE / *Araştırma Makalesi*

Single-Center, 14-Year Experience of Ganglions of the Hand and Wrist

Tek Merkezde 14 Yıllık El ve El Bilek Ganglionları Deneyimi

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Abstract

Objective	The aim of present study is to evaluate a large clinical population of patients operated with diagnosis of ganglion in a single center over a 14-year period.
Materials and Methods	One hundred and sixty-seven patients operated and histopathologically diagnosed with ganglion cyst located in hand and wrist were included in the study. The retrospectively analyzed parameters included age, gender, localization, clinical presentations, site, treatment methods and histopathological features. Recurrences, complications and outcomes were evaluated by phone calls. Statistical analyses and descriptive statistics were presented with frequencies and percentages.
Results	The average age of the patients was 40.70±15.68 years (range, 3-83 years). Majority of the patients (62.87%; n: 105) were in the 2nd – 4th decade of life. Pain and cosmetic concerns were the main complaints of the patients. The majority of the ganglions were located in the wrist (n: 114; 68.26%), and the majority of the wrist location was dorsal (n: 65; 38.92%). Mean follow-up time of 85 patients who could be reached by phone and agreed to participate in the study was 8.60±1.95 years. Recurrence rate among these patients was 7% (n: 6).
Conclusion	Recurrence rates of the ganglion excision are widely variable ranging from 5%-40%. Low recurrence rates can be achieved with detailed preoperative surgical planning and complete resection of the cyst including the stalk and a cuff of adjacent tissue.
Keywords	Ganglion cysts; wrist; recurrence; surgery.

Öz

Amaç	*Çalışmamızda, tek merkezli, 14 yıllık dönemde, ganglion ön tanısı ile cerrahi tedavi uygulanan geniş bir hasta popülasyonunun klinik değerlendirilmesi amaçlanmaktadır.*
Gereç ve Yöntemle	*El ve el bileği yerleşimli ganglion kisti ön tanısı ile cerrahi tedavi uygulanan ve histopatolojik olarak tanısı konulan 167 hasta çalışmaya dahil edildi. Yaş, cinsiyet, bölge, klinik tablo, ameliyat edilen taraf, tedavi yöntemleri ve histopatolojik özellikler retrospektif olarak değerlendirildi. Telefon görüşmeleri ile nüksler, komplikasyonlar ve sonuçlar değerlendirildi. İstatistiksel analizler ve tanımlayıcı istatistikler sıklık ve yüzdelerle sunuldu.*
Bulgular	*Hastaların ortalama yaşı 40,70±15,68 yıl idi (dağılım, 3-83 yıl). Hastaların büyük çoğunluğu (%62,87; n: 105) 2. - 4. dekat arasındaydı. Hastaların temel şikayetleri ağrı ve kozmetik kaygılardı. Ganglionların büyük çoğunluğu (%68,26; n: 114) el bilek yerleşimliydi; bunlar da çoğunlukla el bilek dorsalinde yerleşmişlerdi (n: 65; 38,92%). Telefonla arandığında ulaşılabilen ve çalışmamıza katılmayı kabul eden 85 hastanın ortalama takip süresi 8,60±1,95 yıl idi. Bu hastalarda nüks oranı %7 (n: 6) bulundu.*
Sonuç	*Ganglion eksizyonlarında nüks oranı %5 ile %40 arasında değişkenlik göstermektedir. Düşük nüks oranlarına dikkatli ameliyat öncesi planlama ve kistin sapını ve bağlı olduğu dokunun bir kısmını da içerecek şekilde bir bütün olarak çıkarılması ile ulaşılabilir.*
Anahtar Kelimeler	*Ganglion kistleri; el bileği; nüks; cerrahi.*

INTRODUCTION

Ganglions are the most common masses encountered in hand and wrist region, affecting women more commonly than man.[1,2] They occur in patients of all ages, with peak incidence between second and fourth decade of life.[3] Ganglions usually manifest solitary and there are four typical locations at which ganglion cysts are most likely to arise; dorsum of the wrist, volar wrist, dorsal distal interphalangeal joint and volar metacarpophalangeal joint.[4]

Asymptomatic patients can be followed without intervention with educating and reassuring the patient regarding the mass. Indications for the treatment of ganglions include pain, stiffness, paresthesia, weakness and cosmetic concerns. Current treatment options include aspiration alone or combined with injection of various substances, surgical excision via open or arthroscopically.[5-7]

The aim of this study is to evaluate a large clinical population of patients operated with diagnosis of ganglion in a single center over a 14-year period.

MATERIAL and METHODS

A descriptive cross-sectional study was designed. Retrospective analyses were designed with the patients treated in a single center due to soft tissue tumors located in the hand and wrist between 2005-2019. Medical records were retrospectively reviewed by searching the databases. One hundred and sixty-seven patients operated and histopathologically diagnosed with ganglion cyst located in hand and wrist were included in the study. The retrospectively analyzed parameters included age, gender, localization, clinical presentations, site, treatment methods and histopathological features. Approval from the Akdeniz University Faculty of Medicine Clinical Research Ethics Committee (24.02.2021/KAEK-156) and informed consents were obtained.

All ganglions were excised via open surgical approaches under regional or general anesthesia. Stalk was removed and joint capsule was left open when ganglion cysts originated from a joint. No cast was applied and active range of motion was allowed postoperatively. Recurrences, complications and outcomes were evaluated by phone calls. Statistical analyses and descriptive statistics were presented with frequencies and percentages.

RESULTS

The demographics of the patients were presented in Table 1. The average age of the patients was 40.70±15.68 years (range, 3-83 years). Majority of the patients (62.87%; n: 105) were in the 2nd – 4th decade of life. One hundred and two patients (61.08%) were female and 65 (38.92%) were male. Twelve pediatric patients were observed (6 boys, 6 girls). Among all lesions, 84 cases occurred in the right hand, 83 in the left hand.

Table 1. Demographic and clinical characteristics of the patients diagnosed with ganglion cyst located in hand and wrist.

	Number (n)	Percentage (%)
Gender		
Female	102	61.08
Male	65	38.92
Operation side		
Right	84	50.30
Left	83	49.70
Age		
< 20 years	14	8.39
20 – 49 years	105	62.87
50 – 69 years	43	25.75
> 70 years	5	2.99
Ganglion localization		
Dorsal wrist	65	38.92
Volar wrist	49	29.34
Fingers	31	18.56
Hand dorsum	19	11.38
Palm	3	1.80
TOTAL	**167**	**100**

Pain and cosmetic concerns were the main complaints of the patients. The majority of the ganglions were located in the wrist (n: 114; 68.26%), and the majority of the wrist

location was dorsal (n: 65; 38.92%). Other locations of the lesions were fingers in 31 patients (18.56%), dorsum of the hand in 19 patients (11.38%), and the palm in 3 patients (1.80%) (Table 1). The distribution of the lesions according to fingers were 4 (2.39%), 3 (1.80%), 15 (8.98%), 7 (4.20%), 2 (1.19%) ganglions in 1st, 2nd, 3rd, 4th and 5th fingers, respectively.

Phone calls were placed to all 167 patients. Eighty-five of these could be reached by phone and agreed to participate in the study. Mean follow-up time was 8.60±1.95 years. Recurrence rate among these patients was 7% (n: 6). One of them was re-operated and 5 patients did not want to undergo surgery and were followed conservatively (Table 2). Eleven patients (13%) complained of mild to moderate pain in the operation site after prolonged activity. They were also followed conservatively. The remaining 68 patients (80%) did not have any complaints or recurrences and were highly satisfied with the result.

Table 2. Localization of the ganglions and clinical characteristics of the patients who had recurrences.

	Age	Gender	Localization	Re-operation
Patient 1	54	Male	L- Dorsal wrist	No
Patient 2	55	Male	L- Volar wrist	No
Patient 3	39	Male	R- Dorsal wrist	No
Patient 4	40	Male	R- Dorsal wrist	No
Patient 5	35	Male	R- Dorsal wrist	No
Patient 6	61	Male	L- Volar wrist	Yes
L: Left, R: Right				

DISCUSSION

The results of the analysis of present study was consistent with the previously published data. Ganglions are observed approximately 2 times more frequently in women than in men. In a study reported by Stephen et al, this ratio was 3.1:1; in another study evaluating flexor tendon sheath ganglions, it was 2.6:1.[8,9] Kulinski et al. reported 2.8:1 female/male ratio in 520 ganglion cases.[10] The female/male ratio of the present study was 1.6:1. According to Rollins et al., female patients are also more predisposed to ganglion recurrence.[11] However, contrary to this, in present study recurrences were all observed in men.

The peak incidence of ganglions was reported between the ages of 20 and 40.[3] Kulinski et al. reported that more than 220 of 520 patients (above %42) were aged between 20 and 40 years.[10] A higher percentage of patients in that age group was reported by Dermon et al. with 56.50%.[12] In another study, the mean age of the patients treated operatively for dorsal wrist ganglion was 24 years. The ratio of the patients aged between 15 and 25 years was 46.20% and 30.80% between 25 and 35 years.[13] Among the previously published studies, one of the highest percentage was in our study; 62.87% (n: 105) of the patients were in the 2nd – 4th decade of life. This data extracted from present study and the literature allow us to conclude that ganglions are a problem affecting mainly young and middle-aged adults.

The hand and wrist ganglions do not tend to affect one side of the body (left or right) more frequently than the other.[14] Our study confirmed this observation. Among all lesions, 50.30% (n:84) occurred in the right hand, 49.70% (n:83) in the left hand.

Painless mass is the most common presenting complaint for ganglions.[15] Patients seek treatment when ganglions become associated with pain, weakness, paresthesia, interference with activities or cosmetic concerns. The cause of pain is unknown; it has been assumed to be caused by nerve compression. However, pain, if present, is more likely to be annoying than debilitating. In one study, 89% of the patients reported pain but only 19% felt that it interfered with normal daily activities.[16] In present study, main complaints of the patients were pain and cosmetic concerns. Moreover, consistent with the literature, pain was mostly annoying, not interfering with daily activities. Treatment options for ganglions can be broadly divided into observation, aspiration (alone or combined with injection of various substances) and surgical excision. Even for the most common treatment modalities, the literature has

marked variability in outcomes. However, when compared with aspiration, open surgical excision offers a significantly lower chance of recurrence. In a systematic review and meta-analysis, open surgical excision had a mean recurrence of 21%, compared with a recurrence rate of 59% for aspiration.[2] In a randomized controlled trial, Jagers et al. found that open surgical excision had significantly lower recurrence (24%) compared with aspiration and hyaluronidase injection (77%).[17] Furthermore, recurrence rates in open surgical excision are widely variable in the literature ranging from 5%-40%.[16] Our recurrence rate was 7% with a mean follow-up time of 8.60±1.95 years. We believe that this low rate of recurrence is related to our surgical technique. Generally, higher reported rates of recurrence are attributed to inadequate dissection and excision of the cyst. The surgical maneuvers that we do to decrease ganglion recurrence include excision of the cysts down to the stalk, excision of a cuff of adjacent joint capsule or tendon sheath and circumferentially cauterizing the remaining tissue. This cauterization process also ensures the destruction of the tissues of the cyst that may have been left behind.

Other complications of open ganglion surgery include infection, neuroma, scar formation and persistent pain. Moreover, postoperative stiffness, decreased range of motion and grip weakness may occur. Razemon et al. reported a decrease in prehension strength in almost 17% of patients, and 5 of 36 patients complained of stiffness.[18] In another study of 61 patients who underwent open ganglion excision, moderate to severe pain was observed in 5 patients (10%).[19] In present study, mild to moderate pain in the operation site after prolonged activity was observed in 11 patients (13%). No other complications were observed.

Limitations of the study are retrospective design and absence of a comparison group. Large number of cases and long follow-up period are the strengths of our study.

In conclusion, recurrence rates of the ganglion excision are widely variable ranging from 5%-40%. Low recurrence rates can be achieved with detailed preoperative surgical planning and complete resection of the cyst including the stalk and a cuff of adjacent tissue

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There are no disclosures to declare.

Conflict of interest statement

The Authors declare that there is no conflict of interest.

Ethics Committee Approval

Ethical approval was granted by the Akdeniz University Faculty of Medicine Clinical Research Ethics Committee (24.02.2021/KAEK-156).

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