

Management of Spinal Synovial Cysts

Spinal Sinovial Kistler

ABSTRACT

OBJECTIVE: The report aimed to present the outcome of surgical management of spinal synovial cyst. **Methods:** The study was a retrospective review of six patients surgically treated between January 2005 and September 2007. The patients were evaluated in preoperative and postoperative periods. Evaluation was done by questionnaire scoring system. According to this system, categories were; excellent, good, fair, and poor. **Results:** The duration of follow-up ranged between 3 months and 42 months (mean: 23.3 months; SD: 13.0). Synovial cysts were located in the lumbar spine in 4 of 6 patients. In the other 2 patients, they were in the cervical and thoracic regions. Three patients were female, and three were male. The results of the lumbar group were better than those of the other groups in early period. The findings of the follow-up evaluations were better than those determined in the early postoperative period in all the groups. **Conclusions:** Surgery is an effective treatment for spinal synovial cysts, especially for lumbar synovial cysts.

KEY WORDS: Synovial cyst, Spine, Surgery

ÖZ

Çalışmada, spinal sinovial kistlerin cerrahi sonuçları değerlendirilmiştir. Çalışma, Ocak 2005 ve Eylül 2007 tarihleri arasında cerrahi uygulanan altı hastanın retrospektif olarak değerlendirilmesidir. Hastalar preoperatif ve postoperatif dönemlerde değerlendirilmiştir. Değerlendirme 'questionnaire scoring system' ile yapılmıştır. Bu sisteme göre hastalar; mükemmel, iyi, aynı ve kötü olarak sınıflandırılmıştır. Takip süresi 3 ay ve 42 ay (ortalama:23.3 ay; SD:13.0) arasındadır. Altı hastanın dördü lomber omurgada yerleşmiştir. Diğer iki hastada lokalizasyon servikal ve torakal bölgelerdir. Üç hasta erkek ve üç hasta kadın idi. Erken dönemde özellikle lomber grup sonuçları iyi idi. Takip bulguları tüm gruplar için erken döneme göre daha iyi idi. Sonuç olarak, cerrahi, spinal sinovial kistlerin ve özellikle lomber bölge yerleşimli olanların tedavisinde etkili bir tedavidir.

ANAHTAR SÖZCÜKLER: Spinal kist, Omurga, Cerrahi

Gökmen KAHILOĞULLARI

Hakan TUNA

Ayhan ATTAR

Ankara University, Medical Faculty
Department of Neurosurgery, Ankara, Turkey

Received: 09.03.2008

Accepted: 05.05.2008

Correspondence address:
Gokmen KAHILOĞULLARI
E-Mail: gokmenkahil@hotmail.com
Phone: 0312 222 01 80

INTRODUCTION

Synovial cysts of the spine are cystic dilatations of the synovial sheaths and may occur in all the spinal areas: cervical, thoracic or lumbosacral (2, 6, 22, 25). They are more prevalent in the lumbar spine and especially at L4-L5 level in all series (6, 10, 13, 14, 20). In this pathology, nerve root is compressed by the cyst, contributing to central and/or lateral recess stenosis (6, 13, 14). The cause of synovial cyst is still unclear. However, it underlies spinal instability, facet joint arthropathy and degenerative spondylolisthesis (6, 10, 20). In this study, 6 patients with synovial cysts who were operated in our clinic have been presented. The outcome of the treatment was compared with the outcome of other series.

MATERIAL and METHODS

Six patients with diagnosis of synovial cyst underwent operation in Ankara University, Department of Neurosurgery, between January 2005 and September 2007. All the patients had routine X-ray radiographs and MR imaging preoperatively. All the operations were done under surgical microscope using microneurosurgical technique. The patients underwent decompression with excision of the synovial cyst. The samples of the operation material were histologically evaluated. All the signs and symptoms were evaluated in preoperative and postoperative period. After the first operation, the patients were evaluated in the first and third months and further months during the follow-up period. In the postoperative period, the outcome of the patients was assessed using a questionnaire scoring system (scale: from 1 to 4). According to this system; score 4 indicates excellent (complete resolution of symptoms); score 3, good (minor, occasional pain); score 2, fair (had improvement but still experienced a constant, lower degree of preoperative symptoms, had surgical complications or infections) and score 1, poor (worse or continued to experience all preoperative symptoms) outcome.

RESULTS

The locations of the synovial cysts in our series were one in the cervical and thoracic regions and four in the lumbar spine. In lumbar location, the cysts of 3 out of 4 patients were at L4-L5 level, and the other was at L5-S1 level. The patients ranged in age between 46 and 71 years (mean age: 54.3 years; SD: 9.1). Male-to-female ratio was 1:1 for all the groups, while it was 3 male and 1 female in the

lumbar level group. On the other hand, there was no male patient in the cervical or thoracic level groups. All 6 patients presented with neck pain and back pain and except the patient with thoracic synovial cyst, all of them complained of extremity pain. None of the patients had radicular symptoms. No neurological deficits were found in any of the patients. Preoperative dynamic X-rays revealed an incidence of facet arthropathy, especially in the lumbar group. In all the patients, synovial cysts were revealed by MRI (Figure 1, 2). The results of the histopathological studies indicated synovial cyst in all the patients. No patient required stabilization intraoperatively or in the follow-up period.



Figure 1: Synovial cyst, on the right side of L4-L5 level on the axial section of the lumbosacral MRI.

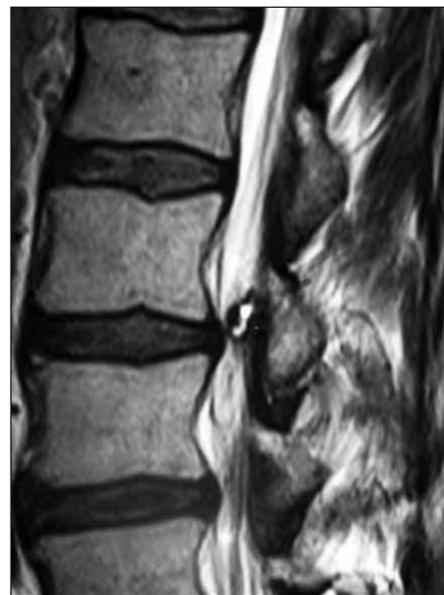


Figure 2: Synovial cyst, at level L4-L5 on the sagittal section of the lumbosacral MRI (blue arrow).

In the follow-up period, the best outcome was in the lumbar group. In the early postoperative period, the cervical and thoracal groups presented fair outcome, while the lumbar group presented good outcome. In the postoperative first and second months, the outcome improved especially in the lumbar group. In time, the outcome of all the groups except that of the thoracal group turned excellent. The outcome of the thoracal group was good at the end of this time. The follow-up period ranged between 3 months and 42 months (mean: 23.3 months; SD:13.0).

The results of the patients have been presented in (Table I).

DISCUSSION

Synovial cysts are rare causes of neck pain, back pain, and radiculopathy. This pathology is more frequently located in the lumbar spine as was in our series (4, 13, 14, 18, 23) and very rare in the cervical and thoracic spine (2, 15, 16). Majority of synovial cysts occur in the lumbar spine (over 90%), while cervical (under 5%) and thoracic (under 5%) lesions are encountered rarely. The most frequent location of synovial cyst in the lumbar level is L4-L5 as was in half of our patients. Surgery has been generally recommended for the treatment of this pathology, with early postoperative benefits to the patient. Patients with synovial cysts typically have presented in their mid-60s in the studies from the Western world (6, 11, 13, 17). The mean age of our patients was 54.3. This difference may be associated with socio-economical status of the individuals. Male-to-female ratios were nearly 1:1 in the other series as

was our series, while it was sometimes differed in some series reported earlier as 1:2 or 2:1 (13, 17, 20).

Preoperative dynamic X-rays revealed an increased incidence of facet arthrosis with or without grade I spondylolisthesis (17). Computed tomography (CT) could be helpful for diagnosis (25). CT demonstrated a series of low-density masses adjacent to the facet joints and sometimes a dense rim indicated a calcified wall on the cyst. Nevertheless, magnetic resonance imaging (MRI) is the best imaging modality for the diagnosis of synovial cyst (4, 6,10, 23).

Synovial cysts associated symptoms are generally neck pain, back pain and unilateral or bilateral radiculopathy (6, 9, 14, 17). Neurological deficits as motor deficits or sensory deficits and reflex abnormalities could be seen in approximately 50% of patients (13). In our series, all the patients had neck pain or back pain similar to those reported in other series. Five of 6 patients in our series suffered radiculopathy, except the patient who had synovial cyst at the thoracal level. There were no neurological deficits in our series.

In some of the earlier reports, the patients with synovial cysts presented hemorrhagic problems (19). Symptomatic epidural hematoma caused by synovial cysts (1, 24) or hemorrhagic synovial cyst secondary to anticoagulation therapy (5) have been described. In our series, no hemorrhagic problems occurred.

Various treatment models for synovial cysts have been recommended. Shah and Lutz have stated that nonsurgical management in patients with lumbar

| No | Age | Gender | Presentation | Location | Postop. | 1 st month | 3 rd month | Further months |
|----|-----|--------|---------------------------|----------|---------|-----------------------|-----------------------|----------------|
| 1 | 49 | F | Neck pain, left arm pain | C1-C2 | Fair | Good | Excellent | Excellent |
| 2 | 58 | F | Back pain, Left leg pain | L5-S1 | Good | Excellent | Excellent | Excellent |
| 3 | 71 | M | Back pain, left leg pain | L4-L5 | Good | Excellent | Excellent | Excellent |
| 4 | 46 | M | Back pain, right leg pain | L4-L5 | Good | Good | Excellent | Excellent |
| 5 | 52 | F | Back pain | T8-T9 | Fair | Good | Good | Good |
| 6 | 50 | M | Back pain, right leg pain | L4-L5 | Good | Excellent | Excellent | - |

synovial cyst-induced radicular pain does not appear to be as successful as surgery (22). On the other hand, some spontaneous regressions of symptomatic synovial cysts have been reported earlier (3, 7, 8). Koga et al reported an alternative treatment model involving percutaneous CT-guided puncture and steroid injection for the treatment of lumbar discal cyst in a patient (12). Sandhu et al have advocated minimally invasive surgical treatment of lumbar synovial cysts with tubular retractor system (21). Under normal circumstances, standard open surgical treatment remains to be the best option for the treatment of spinal synovial cysts (11, 13, 18, 23).

CONCLUSION

Surgery should be considered for patients with spinal synovial cyst because of its benefits in the early postoperative period as well as in the postoperative follow-up period. Surgery may prove particularly more effective in patients with lumbar synovial cysts. Our opinion is the patients with synovial cyst should be operated when there are consistent symptoms, especially in lumbar synovial cysts.

REFERENCES

1. Brown C, Stambough JL: Epidural hematoma secondary to a rupture of a synovial cyst. *Spine J* 5: 446-450, 2005
2. Cohen-Gadol AA, White JB, Lynch JJ, Miller GM, Krauss WE: Synovial cysts of the thoracic spine. *J Neurosurg Spine* 1: 52-57, 2004
3. Colen CB, Rengachary S: Spontaneous resolution of a cervical synovial cyst. Case illustration. *J Neurosurg Spine* 4: 186, 2006
4. Doyle AJ, Merrilees M: Synovial cysts of the lumbar facet joints in a symptomatic population: prevalence on magnetic resonance imaging. *Spine* 29: 874-878, 2004
5. Eck JC, Triantafyllou SJ: Hemorrhagic lumbar synovial facet cyst secondary to anticoagulation therapy. *Spine J* 5: 451-453, 2005
6. Epstein NE: Lumbar synovial cysts: a review of diagnosis, surgical management, and outcome assessment. *J Spinal Disord Tech* 17: 321-325, 2004
7. Ewald C, Kalf R: Resolution of a synovial cyst of the lumbar spine without surgical therapy: a case report. *Zentralbl Neurochir* 66: 147-151, 2005
8. Houten JK, Sanderson SP, Cooper PR: Spontaneous regression of symptomatic lumbar synovial cysts. Report of three cases. *J Neurosurg* 99: 235-238, 2003
9. Kemaloglu S, Nas K, Gur A, Bukte Y, Ceviz A, Ozkan U: Synovial cyst at the intervertebral foramina causing lumbar radiculopathy. *Spinal Cord* 39: 399-401, 2001
10. Khan AM, Girardi F: Spinal lumbar synovial cysts. Diagnosis and management challenge. *Eur Spine J* 15: 1176-1182, 2006
11. Khan AM, Synnot K, Cammisa FP, Girardi FP: Lumbar synovial cyst of the spine: an evaluation of surgical outcome. *J Spinal Disord Tech* 18: 127-131, 2005.
12. Koga H, Yone K, Yamamoto T, Komiya S: Percutaneous CT-guided puncture and steroid injection for the treatment of lumbar discal cyst: a case report. *Spine* 28: 212-216, 2003
13. Lyons MK, Atkinson JL, Wharen RE, Deen HG, Zimmerman RS, Lemens SM: Surgical evaluation and management of lumbar synovial cysts: the Mayo Clinic experience. *J Neurosurg* 93: 53-57, 2000
14. Metellus P, Fuentes S, Adetchessi T, Levrier O, Flores-Parra I, Talinau D, Dufour H, Bouvier C, Manera L, Grisoli F: Retrospective study of 77 patients harboring lumbar synovial cysts: functional and neurological outcome. *Acta Neurochir (Wien)* 14: 47-54, 2006
15. Okamoto K, Doito M, Yoshikawa M, Manabe M, Sha N, Yoshiya S: Synovial cyst at the C1-C2 junction in a patient with atlantoaxial subluxation. *J Spinal Disord Tech* 17: 535-538, 2004
16. Oliveira HA, Jesus AC, Prado RC, Santos AC, Sobral PM, Oliveira AM, Marcena SM, Silveira DR: Synovial cyst of the thoracic spine. *Arq Neuropsiquiatr* 65: 838-840, 2007
17. Onofrio BM, Mih AD: Synovial cysts of the spine. *Neurosurgery* 22:642-647, 1988
18. Pirotte B, Gabrovsky N, Massager N, Levivier M, David P, Brotchi J: Synovial cysts of the lumbar spine: surgery-related results and outcome. *J Neurosurg* 99: 14-19, 2003
19. Ramieri A, Domenicucci M, Seferi A, Paolini S, Petrozza V, Delfini R: Lumbar Hemorrhagic synovial cysts: diagnosis, pathogenesis, and treatment. Report of 3 cases. *Surg Neurol* 65: 385-390, 2006
20. Sachdev VP, Savitz MH, Hindi AI, Goldstein HB: Synovial cysts of the lumbar facet joint. *Mt Sinai J Med* 58: 125-128, 1991
21. Sandhu FA, Santiago P, Fessler RG, Palmer S: Minimally invasive surgical treatment of lumbar synovial cysts. *Neurosurgery* 54: 107-112, 2004
22. Shah RV, Lutz GE: Lumbar intraspinal synovial cysts: conservative management and review of the world's literature. *Spine J* 3: 479-488, 2003
23. Trummer M, Flaschka G, Tillich M, Homann CN, Unger F, Eustacchio S: Diagnosis and surgical management of intraspinal synovial cysts: report of 19 cases. *J Neurol Neurosurg Psychiatry* 70: 74-77, 2001
24. Wait SD, Jones FD, Lonser RR, Lee KS: Symptomatic epidural hematoma caused by lumbar synovial cyst rupture: a report of two cases review of the literature. *Neurosurgery* 56: E1157, 2005
25. Wang AM, Haykal HA, Lin JC, Lee JH: Synovial cysts of the lumbar spine: CT evaluation. *Compu Radiol* 11: 253-257, 1987