

Intraspinal synovial cysts: A retrospective study

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Background: We report the clinical presentation, radiographic studies, intraoperative findings, histopathological analysis, and post-treatment outcome in 26 patients diagnosed with spinal synovial cysts (SSCs). **Aims:** To describe the clinical presentation, radiographic studies, operative findings, and postoperative follow-up in 26 patients with SSCs. **Settings and Design:** The study was retrospective in design, involving chart review. Individual patient data was tabulated and patterns were recognized. **Materials and Methods:** The charts for 26 patients who underwent surgical extirpation of SSC between April 1993 and October 2002 were retrospectively reviewed. Specifically, initial clinical presentation, pertinent radiographs (X-rays, magnetic resonance imaging, computed tomography), intraoperative findings, histopathology, and postoperative follow-up were noted. **Statistical Analysis Used:** Patient data was tabulated and analyzed for patterns in demographics, symptoms and histopathology. **Results:** SSCs were more common in females than males (17:9 ratio). Presenting symptoms were back pain with radiculopathy in 13 (50%), radicular pain in the absence of back pain in 10 (38%), and back pain without radicular pain in three (11%). In addition, 17 patients (65%) had sensory deficit, and 9 (35%) had motor deficit. Most SSCs occurred at the lumbar (19/26) or lumbosacral (5/26) regions, with only 2 (2/26) in the thoracic region. One patient had bilateral SSC at the L4-5 level. Intraoperatively, each cyst was located adjacent to a degenerated facet joint. These lesions could grossly be identified intraoperatively and histopathological confirmation was achieved in all the cases. **Conclusions:** SSCs are important lesions to consider in the differential diagnosis of lumbar epidural masses and surgical resection leads to significant improvement in the majority of cases.

Key words: Extradural, facet joint, spine, synovial cyst

Introduction

We report the clinical presentation, radiographic studies, intraoperative findings, histopathological analysis, and post-treatment outcome in 26 patients diagnosed with SSC. Results from the present study, in the context of findings from other pertinent series, are reviewed.

Materials and Methods

The charts of 26 patients treated for SSCs between April 1993 and October 2002 were retrospectively reviewed. Specifically, clinical presentation (initial history and physical examination), radiographic studies (X-rays and magnetic resonance imaging (MRI) in 26 patients, with computed tomography (CT) in one), intraoperative findings, histopathology, and post-operative follow-up were noted.

Individual data for each patient appears in [Table 1]. Collectively, specific patterns for SSCs were recognized.

The median age at diagnosis was 55.9 years (range = 27 to 80 years). Females were more frequently affected (17:9 ratio) in comparison to males. With respect to distribution of pain, a radicular distribution was the presenting symptom in almost all cases (23/26), accompanied by back pain in 13 cases. Back pain alone was found in only three cases. Sensory deficits were common (17 out of 26 patients, 65%), with motor deficits being less frequent (9 out of 26 patients, 34%) at presentation. The mean duration of symptoms prior to diagnosis was 12.7 months (range = 1 to 36 months).

Results

The majority of SSCs were located in the lumbar (19 out of 26, 73%) or lumbosacral (5 out of 26, 19%) regions, with only two SSC (7%) located in the thoracic region of the spine. One patient had bilateral SSC at L4-5 level (case no 23). Only one patient

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Table 1: Summary of 26 Cases with SSC

Patient	Age/sex	Pain/location surgery	History of trauma/symptoms	Duration of deficit	Sensory deficit	Motor location	Cyst	Operative approach	Followup
1	62/F	Back L4 - 5	-	6 months	L5	0	L4 - 5	Laminectomy Excision	2 years
2	73/F	L4 -5	DiscSurgery	3 years	L4 -5	-EHL*	L4 -5	Laminectomy Excision	3 years
3	54/F	L4 -5	-	2 months	L4 - 5	0	L4 - 5	Laminectomy Foraminotomy	3 years
4	42/F	L5 - S1	-	1 year	L5	-AJ†	L5 - S1	Laminectomy Excision	3 years
5	56/F	Back L4 - 5	Surgery for L4-5 benign lesion 20 years ago	2 years	L4 - 5	-EHL	L4 -5	Laminectomy Excision	2 years
6	44/F	Back L5	-	3 months	S1	0	L5 - S1	Laminectomy Excision	18 months
7	52/F	L3 -4	-	3 years	L3 - 4	0	L3 - 4	Laminectomy Excision	1 year
8	48/F	L4 -5	-	1 year	L4 - 5	-EHL	L4 -5	Laminectomy Excision	1 year
9	47/F	L4 - 5	-	2 months	0	0	L4 - 5	Laminectomy Excision	6 months
10	77/F	Back	-	3 years	0	0	T11 - 12	Laminectomy Excision	6 months
11	80/M	Back L4	-	3 months	0	0	L3 - 4	Hemilaminectomy Excision	1 year
12	73/M	Back L4 - 5	-	2 years	L4 - 5	-EHL	L4 -5	Hemilaminectomy Excision	3 years
13	56/M	Back L4 - 5	-	3 months	L4 - 5	0	L4 - 5	Laminectomy Excision	3 months
14	45/M	Back L5 - S1	-	6 months	L5 - S1	-AJ	L5 - S1	Laminectomy Excision	5 years
15	42/M	Back L5 - S1	L4 - 5 Discectomy	5 months	L5 - S1	-AJ	L5 - S1	Hemilaminectomy Excision	5 years
16	27/F	L4 - 5	-	6 months	L4 - 5	0	L4 - 5	Laminectomy Excision	2 years
17	40/F	L5	Spinal Trauma +	2 years	L5	-EHL	L4 -5	Laminectomy Excision	5 years
18	72/F	L5	-	3 years	L5	0	L4 - 5	Laminectomy Excision	9 months
19	40/M	Back L3-4	L4-S1 fusion	2 months	0	+KJ‡	L2 - 3	Laminectomy Excision	3 months
20	61/F	L5	L3-5 laminectomy	2 months	0	0	L4 - 5	L4-5 Partial Facetectomy	3 months
21	52/F	Back L5	-	9 months	0	0	L4 - 5	L4-5 Hemilaminectomy	4 months
22	57/M	Back L5	-	2 years	L5	0	L4 - 5	L4-5 Laminectomy	4 months
23	54/F	Back, L5	laminectomy	1 year	L5	0	B/L, L4-5	L4-5 laminectomy	3 months
24	72/M	Back	-	3 months	0	0	L5 - S1	No bone removal	1 month
25	57/M	Back, L5	-	1 month	0	0	L4 -5	Hemilaminectomy	3 months
26	71/F	Back	-	2 months	0	0	T11-12	Laminectomy	1 month

* -EHL -Extensor Hallucis Longus, † -AJ- Ankle Jerk, ‡ +KJ- Knee Jerk

had history of prior trauma, while six others underwent prior surgery for herniated disc excision, canal stenosis, instability, or a benign lesion. One patient had a disc herniation associated with the SSC. All patients underwent surgical excision of the cyst. Nineteen patients underwent laminectomy, while in five patients, the excision could be accomplished through a hemilaminectomy. One partial facetectomy was also performed. In one patient, the inter-laminar space was wide enough so the cyst was visualized after incising the ligamentum flavum not requiring any bone removal (case no 24). The adherence of some SC to the dura can make the dissection really problematic in some instances (Risk of dural tear, risk of root lesion with the Kerrison, risk of incomplete SC resection). Postoperatively, significant pain relief was noted in practically all patients. Sensorimotor deficits improved in all patients, however, four of the patients continue to demonstrate mild sensory deficits.

Postoperative complications included a cerebrospinal fluid wound leak following resection of a lumbosacral SSC in one patient, which required subsequent intraoperative primary repair and a superficial wound infection, which was treated successfully by a 1-week regimen of antibiotics.

Histopathologically, 11 specimens revealed a true synovial epithelial lining; the remainder were either ganglion cysts (where no epithelial lining was present) or had features of both true synovial and ganglion cysts, as discussed in greater detail in the following section (see “Histopathology” under the Discussion section). Dystrophic calcification was present in the walls of 3 ganglion cysts.

Discussion

In 1877 Baker defined synovial cysts in association with an adjacent degenerated joint.^[1] The description of a spinal synovial cyst (SSC), in turn, is credited to Von Gruker, who initially discovered this lesion while performing an autopsy.^[1,2] The clinical presentation, imaging findings, treatment, and prognosis related to these lesions have since been better characterized by numerous studies (Figure 1).^[1-32] The majority of studies reported thus far describe findings related to a small number of patients, 32. Only three of these studies involve more than 20 patients.^[1,33,34]

Histopathology

Histopathologically, a continuum is thought to exist between true “synovial cysts” and “ganglion cysts”. While both are thought to arise from periarticular tissues, a true synovial cyst is lined by synovium-like epithelial cells, whereas a ganglion cyst has a collagenous capsule, which surrounds myxoid material in the absence of epithelial cells.^[15] Due to these qualities, these two lesions are often considered as “juxta-articular cysts,” “juxta-facet cysts,” or “intraspinal facet cysts.”^[15,16] The distinction between true synovial and ganglion cysts is purely pathological and no difference is noted with respect to surgical treatment or prognosis.^[33] For our purposes, given the similarities, we use the term spinal synovial cyst for either ganglion cysts, true synovial cysts, or cysts with

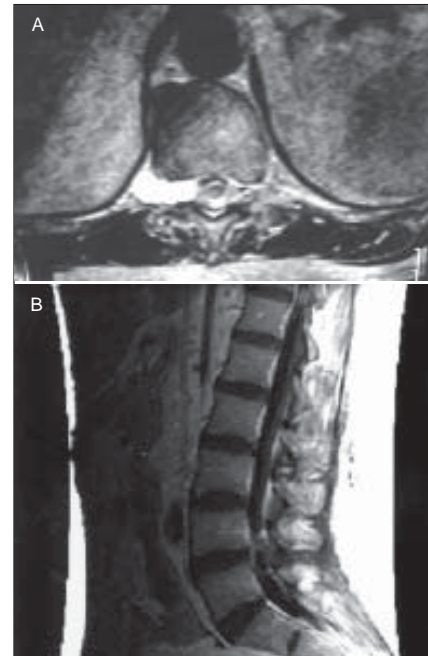


Figure 1: (a) Axial and (b) sagittal post contrast T1W images of the lumbar spine showing a cystic lesion at L4-5 level suggestive of a synovial cyst

variable features of each.^[1]

In our study, the tissue from each histopathologically reviewed case revealed a cyst with a thick fibrous wall. In 11 patients the cystic structures were partially lined by synovial cells, hence depicting a “true synovial cyst” [Figure 2]. In the remaining patients, either no epithelial lining or rare flattened cells with significant chronic inflammatory changes were present. As previously mentioned, such features may represent the continuum between true synovial cysts and ganglion cysts [Figure 3]. The presence of calcium, as noted in 3 of the ganglion cyst walls, supports the degenerative, metaplastic changes, which may be associated with these lesions. The facetectomy, is definitely not recommendable. The bipolar coagulation of the synovial membrane

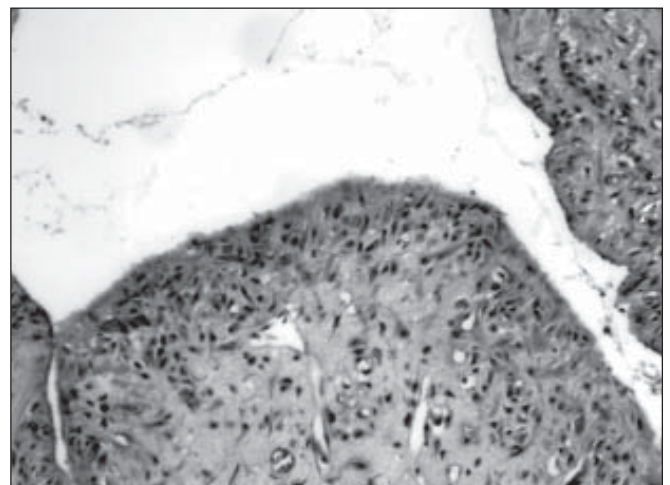


Figure 2: Photomicrograph of a synovial cyst showing a benign cystic structure lined by synovial cells and fibrovascular stroma (H/E, 50x)

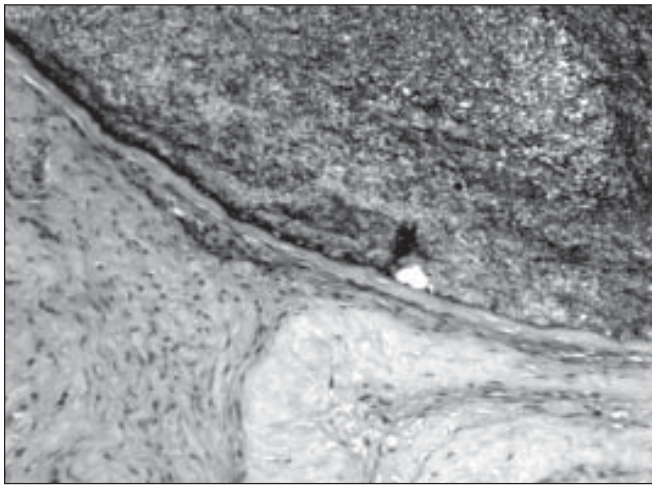


Figure 3: Photomicrograph of a synovial cyst showing chronic inflammatory changes with cystic degeneration and fibrous wall (H/E, 50x)

preserving the interapophyseal joint is also recommended to avoid synovial cyst recurrence.^[34] There is no doubt that synovial cysts express a local instability in predisposed individuals, preferably females. However, it is rarely a mobile instability such as in spondylolysis. It behaves like a transient local degenerative instability occurring during a limited period of the lifetime.

Conclusion

Spinal synovial cysts are likely degenerative lesions with a juxta-facet location. Most occur at the lumbar (L4-5) region and are associated with radicular symptoms, which are best visualized by MRI. Our experience supports that with a careful understanding of the anatomy as visualized by imaging studies, surgical decompression can lead to significant improvement in symptoms.

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