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Clinical Study

Spinal arachnoid cyst

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ABSTRACT

Preoperative, operative and postoperative radiological examinations and operative notes of 31 patients with spinal arachnoid cyst operated on during 2002–2009 at the Institute of Medical Sciences, Banaras Hindu University, were evaluated. Sixteen patients were male and 15 were female. All patients were managed surgically: extradural arachnoid cysts were managed by excision and intradural arachnoid cysts were managed by marsupialization. There was no recurrence in the 4 years of follow up.

1. Introduction

Spinal meningeal cysts are rare[1–3] and have been described as "arachnoid cysts," "pouches", and "diverticula".[3–5] The classification of spinal arachnoid cysts traditionally has been complicated. Nabors et al.[4] simplified the classification of spinal meningeal cysts into three major categories: (i) extradural cysts without nerve root involvement (Type I); (ii) extradural cysts with nerve root involvement (Type II); and (iii) intradural cysts (Type III). Spinal meningeal cysts, most often located in the mid- to lower thoracic area,[1,3,6–8] are found predominantly in males,[1,2] and tend to be symptomatic during the second decade of life.[1–3] Patients with an arachnoid cyst usually present clinically with progressive spastic or flaccid paraparesis, or quadriparesis.[1,3,6–8] About 10% of patients present with monoparesis.[1] Sensory deficits are less prominent.[3] The clinical symptoms develop over months,[7] although a fluctuating course may occur in more than one-third of patients.[2] In addition, some patients may have long-term remission, extending for years,[9] and among these patients, reciprocal obstruction and recanalization are thought to mediate remission and relapse.[9,10] Non-traumatic spinal, extradural meningeal cysts are believed to be congenital.[1,2,5,7,8] The proposed causes of cyst expansion are active secretion from the internal cell lining,[7] an osmotic spinal gradient between the subarachnoid space and the cyst,[2,10] pulsatile cerebrospinal fluid (CSF) dynamics,[4,5] and a valve-like mechanism.[1,2,4,6,8,11]

2. Material and methods

At our Institute, the complete preoperative, surgical and postoperative neurological and radiological records for 31 patients with spinal arachnoid cyst who underwent surgery during 2002 to 2009 were evaluated. The study included 16 male and 15 female patients.

2.1. Surgical procedures

The patients underwent surgery under general anesthesia. Laminoplasties were preferred over laminectomies (seven patients) to preserve spinal stability. The level of the laminectomy/laminoplasty was localized using intraoperative fluoroscopy. Liberal skin incisions were used to prevent undue retraction. We usually preferred laminoplasty/laminectomy extending one level above and below the lesion to prevent undue traction on the spinal cord during microdissection. Extradural arachnoid cysts placed posteriorly were managed by cyst excision and ligation of the communicating tracts. Anterior, extradural cysts were managed using a transdural approach. Intradural arachnoid cysts were managed by excision and wide marsupialization.

3. Results

3.1. General observation

The records of 31 patients with spinal arachnoid cyst were evaluated. The numbers and location of the cysts are listed in Table 1. Sixteen (51.61%) patients were male and 15 (48.39%) were female. Two patients had a history of trauma, and two patients had a

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Table 1
Characteristics of 31 patients with arachnoid cysts

Characteristic	Total no. (/31)	Percentage (%)
Spinal region		
Cervical	4	12.9
Cervicodorsal	4	12.9
Dorsal	10	32.3
Dorsolumbar	8	25.8
Lumbar	3	9.7
Sacral	2	6.5
Age distribution (years)		
0–15 years	2	6.5
> 15–30	11	35.5
> 30–45	13	41.9
> 45–60	3	9.7
> 60	2	6.5
Signs and symptoms		
Quadriparesis	4	12.9
Backache	10	32.3
Fluctuating leg weakness	12	38.7
Monoparesis	3	9.7
Radicular pain	2	6.5
Neurogenic claudication	3	9.5
Monoplegia	1	3.2
Incontinence	2	3.2
Parasthesia	3	9.7
Neurogenic bladder	2	6.5

definite history of spinal anaesthesia. No history conclusive of any inflammatory pathology was found.

The age distribution of patients is presented in Table 1. Most patients were aged 30 years to 45 years (13 patients) followed by those aged from 15 years to 30 years (11 patients). The symptoms persisted from 11 months to 17 years, with a mean of 64 months.

A variety of signs and symptoms was recorded (Table 1), which included quadriparesis, backache, fluctuating leg weakness, paraesthesia in any one limb, radicular pain, complete paresis, neurogenic bladder, recurrent urinary tract infection, and neurogenic claudication.

Seven cysts were anterior (Figs. 1 and 2), and 24 were posterior (Fig. 3) in relation to the cord or thecal sac. Fourteen arachnoid cysts were extradural and 17 were intradural (Fig. 4). Out of seven anteriorly placed arachnoid cysts, six were intradural and only one was extradural. Extradural arachnoid cysts had an opening on the left side in nine patients (64.3%), the right side in three patients (21.4%), and in the midline in two patients (14.3%).

3.2. Pathological finding

Histological study of the cyst wall (Figs. 5 and 6) revealed that it was composed of fibrocollagenous tissue with scattered meningoepithelial cells and a focal infiltration of inflammatory cells. There was an inner single-cell membrane. The findings were consistent with that of an arachnoid cyst.

3.3. Follow-up

The patients were followed-up for between 6 months and 4 years (mean duration was 32 months) with no recurrence. Neurological improvement was observed in five patients whereas one patient showed no symptomatic or clinical recovery during follow-up. The patients with anterolateral arachnoid cysts had a marginal deterioration in motor power on one side and did not improve in power on the contralateral side after surgery. Two patients developed a pseudomeningocele during the postoperative period and required re-exploration and dural repair. Two patients had a suture line infection. At the 4-year follow-up, two patients still had residual deficits, but had improved compared to their preoperative status and were independent. There was no recurrence in the 4 years of follow up.

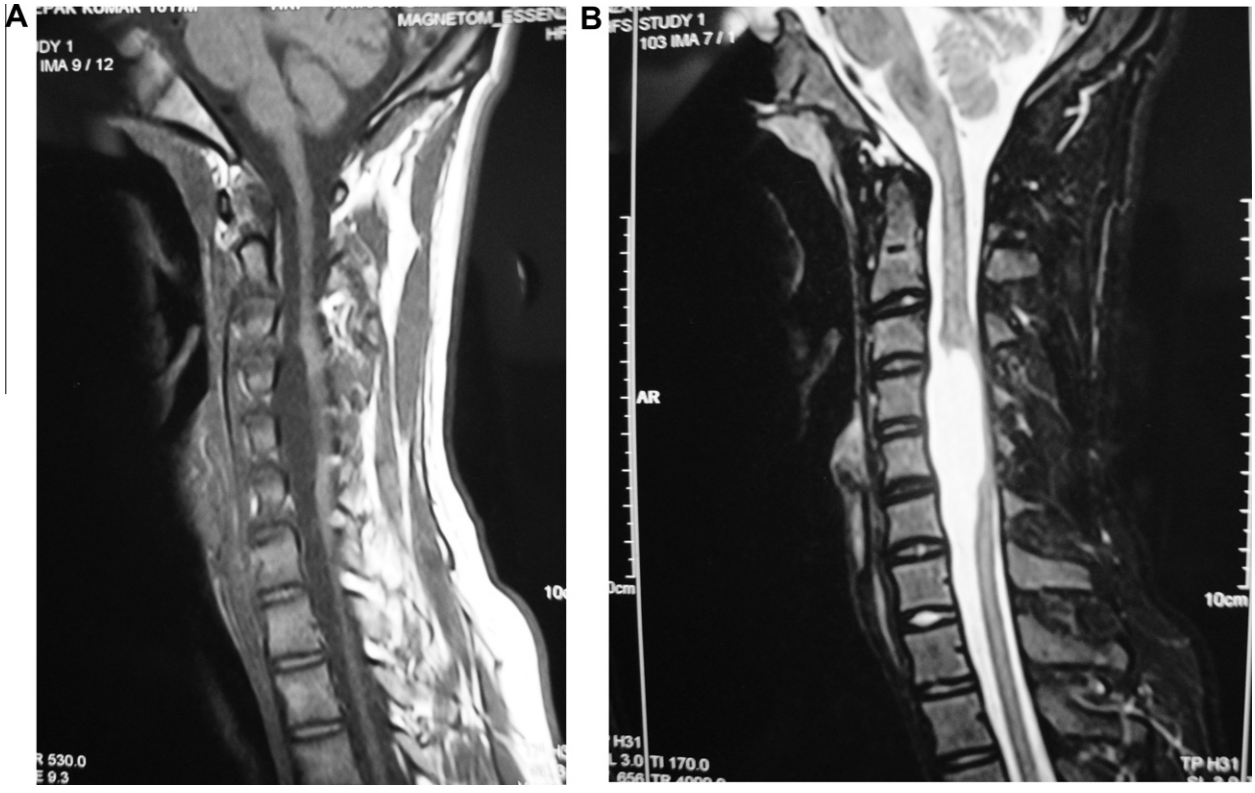

Fig. 1. Sagittal cervical (A) T1-weighted and (B) T2-weighted MRI showing an anteriorly placed arachnoid cyst.