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Case Report

Arachnoid Cyst and Spinal Arachnoiditis after Subarachnoid Hemorrhage: Case Report and Review of the Literature

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Abstract

Arachnoiditis is an inflammatory process leading to fibrosis of the arachnoid and subarachnoid space. Adhesions are formed between fibrin-coated, nerve roots and meninges. Severity varies from mild to severe adhesion causing blocking of cerebrospinal fluid (CSF) flow, resulting in CSF loculations. This condition may be caused by chemical agents, spinal surgery, infection, trauma and after spinal or cerebral subarachnoid hemorrhage (SAH). We reported a case of arachnoid cyst and arachnoiditis after cryptogenic spinal subarachnoid hemorrhage.

Keywords: *Spinal Arachnoiditis; Arachnoid Cyst; Subarachnoid Hemorrhage*

Introduction

Arachnoiditis is an inflammatory process leading to fibrosis of the arachnoid and subarachnoid space. Adhesions are formed between fibrin-coated, nerve roots and meninges.

Case Report

We present a fifty-seven year-old-woman, previously healthy, who presented with acute dorsalgia following with progressive paraparesis and urinary incontinence within a one-week period. At the investigation, MRI demonstrates intrathecal hemorrhage from D2 to S1 accompanied by flow-void at D9 without myelopathy. Spinal and cerebral angiography was normal. The patient was treated conservatively and showed complete improvement within one week. Four months later, the patient returned to the outpatient clinic with back pain and a new MRI exam showing extensive arachnoiditis associated with arachnoid cysts from C6 to S1, without any neurological deficits. Conservative treatment was performed, and the patient presented a good clinical evolution. New MRI was performed one month later. The patient continued with no complaints during the one-year follow-up.

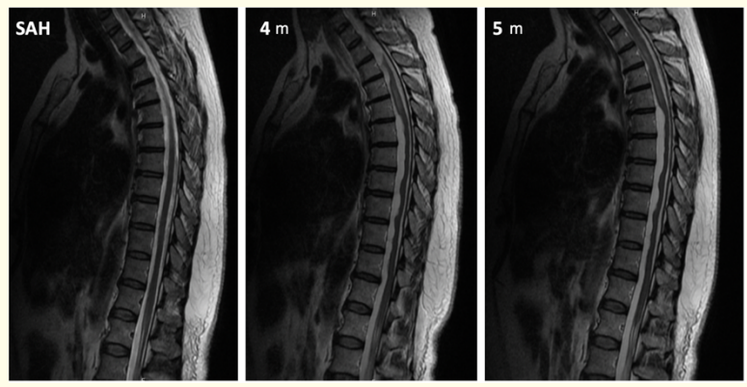

Figure 1: *Left image: MRI of the Spinal Cord SAH hemorrhage. Center image: MRI of 4 months later showing extensive arachnoiditis associated with arachnoid cysts. Right image: MRI of 5 months showing no progression.*

Review of the Literature

Chronic arachnoiditis of the spinal cord associated with cavitation was first described by Schwarz in 1897 [1]. Since then, few cases have been described and its pathophysiology remains uncertain. Spinal Arachnoiditis (SA) rarely causes spinal dysfunction or nerve entrapment. Trauma, hemorrhage, tumors, spine surgery, spinal contrasts, anesthetics, and infections can cause inflammation and arachnoid fibrosis, resulting in adhesions that obstruct the subarachnoid space and can cause cavitation and arachnoid cyst [2].

In 1943, Nelson described the first case spinal arachnoiditis four years after subarachnoid hemorrhage [1]. Since then, the pathophysiological mechanisms of arachnoiditis following subarachnoid hemorrhage remain uncertain.

A literature review was performed in the PubMed database, looking for the association of the descriptors "arachnoiditis", "subarachnoid hemorrhage" which resulted in 60 articles. Only case reports and case series were selected. Articles that related spinal arachnoiditis to other etiologies was excluded. Only 32 cases of arachnoiditis after subarachnoid hemorrhage were found (Table 1) [1,3-26].

Case	Age	Sex	Etiology of SAH	Time of Onset	Symptoms	Local	Treatment	Outcome
Nelson, 1943	50	M	Thrombocytopenic Purpura	4 years	Paraparesis, Leg Pain, Urinary Incontinence	Midthoracic to cauda equina	-	-
Weiss., *et al*. 1962	69	F	-	5 Months	Gait Disturbance, Urinary Incontinence, Weakness	T6	Surgery	Improvement
Augustijn., *et al*. 1989	54	F	PICA Aneurysm	4 Years	Gait disturbance, Weakness	T2-3	Conservative	Unsuccessful
Tjandra., *et al*. 1989	47	M	-	4 Weeks	Back pain, Weakness	T7-11	Surgery	Unsuccessful
Jourdan *et al*., 1990	56	-	PICA Aneurysm	-	-	-	Surgery	Unsuccessful
Taguchi., *et al*. 1996	59	M	Vertebral Aneurysm	3 months	Gait disturbance, Polakiuria, Numberness	T3-8	Surgery	Improvement
Parker., *et al*. 1999	55	-	-	11 Years	Progressive Paraplegia	Thoracic	Conservative	Unsuccessful
Parker., *et al*. 1999	60	-	Basilar Aneurysm	10 Years	Progressive Paraplegia	T5-10	Surgery	Unsuccessful
Parker., *et al*. 1999	66	-	ACoA Aneurysm	20 Years	Paraplegia	T7-10	Surgery	Unsuccessful
Kok., *et al*. 2000	63	F	PCoA Aneurysm	5 Weeks	Paraparesis, Urinary Incontinence	T7	Conservative	Improvement
Kok., *et al*. 2000	68	F	-	4 Months	Pain Leg	C7-T6	Conservative	Improvement
Brodbelt., *et al*. 2003	73	M	PICA Aneurysm	19 Years	Weakness	T6-8	Surgery	Improvement
Tumialán., *et al*. 2005	53	F	PICA Aneurysm	1 Year	Gait Disturbance	C7-T2	Surgery	Improvement
Thines., *et al*. 2005	64	F	Perimesencephalic SAH	10 Months	Progressive Paraplegia	T1-6	Surgery	Improvement
Nakata., *et al*. 2006	66	F	Vertebral Aneurysm	6 Months	Progressive Paraplegia	T3-5	Surgery	Improvement
Marshman., *et al*. 2007	57	F	PICA Aneurysm	2 Years	Progressive Paraplegia, Urinary Incontinence	T1-10	Surgery	Improvement
Silva., *et al*. 2007	54	F	PICA Aneurysm	1 Year	Progressive Paraplegia, Urinary Incontinence	T3-10	Surgery	Unsuccessful

Ginannes-chi., *et al*. 2008	57	F	-	10 Months	Progressive Paraplegia, Urinary Incontinence	T3-9	Surgery	Unsuccessful
Abhinav., *et al*. 2012	58	F	PICA Aneurysm	3 months	Gait Disturbance, Weakness	C6-T6	Surgery	Improvement
Ishizaka., *et al*. 2012	68	F	Basilar Aneurysm	3 Years	Gait Disturbance, Leg pain	T2-T11	Surgery	Improvement
Nakanishi., *et al*. 2012	54	F	MCA Aneurysm	20 Months	Gait Disturbance, Back Pain, Numbness	C2-T10	Surgery	Improvement
Nakanishi., *et al*. 2012	49	M	Vertebral Aneu-rysm	8 Months	Weakness, Lower Nerve Palsy	MO - C6	Surgery	Improvement
Eneling., *et al*. 2012	65	F	PICA Aneurysm	72 Months	Paraplegia	T6-8	Surgery	Unsuccessful
Eneling., *et al*. 2012	57	F	ACoA Aneurysm	18 Months	Progressive Paraplegia, Urinary Incontinence	T3-12	Surgery	Improvement
van Heerden., *et al*. 2013	35	F	PICA Aneurysm	12 Years	Weakness	T8-11	Conservative	-
van Heerden., *et al*. 2013	65	F	PCoA Aneurysm	9 Months	Weakness, Back Pain	T8	Surgery	-
van Heerden., *et al*. 2013	51	F	PICA Aneurysm	4 Years	Weakness, Back Pain	T2-T8	Surgery	-
Whet-stone., *et al*. 2013	75	F	PICA Aneurysm	29 Days	Cauda Equina Syndrome	L5	Conservative	Unsuccessful
Basaran., *et al*. 2014	46	F	Perimesencephalic SAH	4.5 Months	Weakness	C7-T2	Surgery	Improvement
Rahmatul-la., *et al*. 2014	54	F	PICA Aneurysm	4 Months	Progressive Paraplegia	C1-T5	Surgery	Improvement
Atallah., *et al*. 2018	47	-	Vertebral Aneu-rysm	9 Months	Gait Disturbance, Urinary Incontinence, Weakness	T4-6	Surgery	Improvement
Todeschi., *et al*. 2018	57	M	Adamkiewicz An-eurysm	3 Months	Progressive Paraplegia, Urinary Incontinence	C6-T6	Surgery	Improvement
Maeda., *et al*. 2020	57	F	-	4 Months	Back Pain	T2-S1	Conservative	Improvement

Table 1: *Published cases of spinal arachnoiditis and subarachnoid hemorrhage.*

The symptoms usually start a few weeks after the SAH in the thoracic spine, where it is more susceptible. SA has no pattern of symptoms. Chronic pain, numbness, gait disturbance, weakness, and tingling are common, while bowel, bladder, sexual dysfunction can occur in severe compression of the spinal cord [23].

The myelography can demonstrate partial or complete blockage of contrast. CT and MRI contribute to identifying arachnoid cysts, cavitation and spinal cord compression [27,28].

The treatment of spinal arachnoiditis is controversial. The use of corticosteroids has been tried without success. Surgery should be indicated for selected cases in which well-defined arachnoid cysts cause symptomatic spinal or root compression. In other cases, treatment must include medication and rehabilitation [2,9].

Conclusion

In conclusion, SA after SAH can cause myelopathy and radiculopathy, usually in the thoracic spine. The best treatment remains uncertain. While surgical treatment is indicated for selected symptomatic cases of evident radicular or medullary compression, the conservative treatment seems adequate to the majority of cases.

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