

# Is there a link between surgically treated arachnoid cysts and the development of idiopathic intracranial hypertension?

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Arachnoid cysts are common radiological findings, often identified in childhood. The cyst have been linked to various symptoms, mainly dependent on the location. Generally, conservative treatment has been advocated for the adult population whereas many authors advocate a more aggressive approach for pediatric patients. Indications for surgery have been enlargement of cyst, intracranial hypertension, abnormal skull growth, hemorrhage, bony asymmetry, aggravation of symptoms or abnormality/ worsening of serial neuropsychological tests [1-5]. The frequency of arachnoid cysts has been reported to be as high as 2,6% in children who have undergone cerebral imaging [6].

Most arachnoid cysts are believed to be congenital whereas a small percentage is believed to have formed from trauma, inflammation or bleeding [7,8].

Several theories regarding the formation of arachnoid cysts exist. A ball-valve theory has been proposed regarding enlargement of cysts. According to this theory the differential pulsatile movement vectors of the cyst and cerebrospinal fluid (CSF), fluid production by the cells lining the walls of the cysts, fluid shift via osmotic gradient, fluid movements secondary to pulsations of the veins could cause an enlargement of the cyst [7,9]. Other studies have contradicted this by claiming that protein count of cysts and CSF is similar [10].

In a recent review of our own experiences (unpublished data) we identified two cases of idiopathic intracranial hypertension (IIH) developing a few years after an initially successful treatment of arachnoid cysts. Only a few papers have so far reported idiopathic intracranial hypertension appearing in children who have undergone surgical treatment of arachnoid cysts.

The diagnostic criteria of IIH include symptoms and signs of elevated intracranial pressure; normal findings on neuroimaging, excluding nonspecific findings of increased intracranial pressure; and increased CSF pressure with a normal composition [11].

The relationship between arachnoid cysts and IIH has not been much researched although it has been described in a few cases. The IIH has always been described to occur after (1-12 years) the surgical treatment of the arachnoid cyst [12,13]. One publication describes IIH in connection to arachnoid cysts in the Fallopiian canal [14]. A case report dated back to 1996 describes IIH and posterior fossa arachnoid cyst [15] treated with a cystoperitoneal shunt.

One suggested link between the two conditions has been that the diversion of cystic and subdural CSF into the basal cistern might cause decompensation of a preexisting compensated CSF circulation [12,16].

It has also been suggested that the cyst fluid might be different (secreted from the cyst lining cells) from the CSF and hence could affect the circulation of CSF [10]. Other possible causes could be the development of venous thrombosis or stenosis, slit ventricles (due to periventricular or ependymal gliosis), decreased cyst wall compliance after surgery or an imbalance between cyst fluid production and resorption [12].

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