Muslin aneurysm wrapping

Experimental venous pouch aneurysms in rats were wrapped with muscle, bovine collagen, muslin, cotton, or polyvinyl alcohol. The rats were killed 6 or 12 weeks later, and the aneurysms were compared with control aneurysms. Bovine collagen and muscle were reabsorbed and the aneurysms were similar to the control group. Cotton, muslin, and polyvinyl alcohol caused fibrosis around the aneurysm. However, giant aneurysms were found in the muslin and polyvinyl alcohol group. Cotton appears to be the most suitable material for wrapping aneurysms. The experimental venous pouch aneurysm model in rats can be used to evaluate wrapping materials [1].

In 1958 Gillingham popularized wrapping with cotton or muslin [2]. An analysis of 60 patients showed that 8.5% rebled in ≤ 6 mos, and the annual rebleeding rate was 1.5% thereafter [3] (similar to the natural history)

Case series

Mount and Antunes reported the results of the treatment of 58 intracranial aneurysms by wrapping with muscle or muslin gauze, and/or coating with Selverstone plastic material. They concluded that reinforcement with muscle is of little value, but that muslin gauze and plastic produced satisfactory results [4].

Optochiasmal arachnoiditis has been reported following treatment of ruptured intracranial aneurysms, particularly arising from the anterior communicating artery. It has been suggested that the accompanying loss of vision is due to a muslin-induced optic neuropathy. This paper considers five cases of this condition; the response to steroid therapy was beneficial in three cases. A review of the literature is included. The arachnoiditis is considered to be due to an inflammatory response to muslin gauze placed close to the optic nerves and chiasm [5].

Case reports

Muslin foreign body granulomas are a known complication of muslin aneurysm wrapping and have been associated with vision loss from optochiasmatic arachnoiditis. Muslin granulomas have also been confused with abscesses due to surrounding inflammatory changes. Cox et al. presented a unique case of a muslin granuloma mimicking an intraparenchymal hematoma [6].

An 84-year-old woman presented with 3 months of vertical binocular diplopia and difficulty reading at near. She had a history of bilateral ophthalmic artery aneurysm repair involving use of muslin in the 1990s. The patient then developed bitemporal hemianopsia secondary to muslin-induced inflammation (“muslinoma”) extending to the optic chiasm, which required surgical decompression.

She had a persistent bitemporal hemianopsia but was stable for two decades after surgery. In 2017, the patient re-presented with double vision. Exam showed a non-paretic diplopia due to a small angle comitant right hypertropia attributed to the retinal hemi-field slide. Repeat imaging showed no new aneurysm or recurrent muslinoma. This case had originally been reported two decades ago and represents the longest duration of recurrent symptoms from muslin-related optochiasmatic arachnoiditis in the English language ophthalmic literature. Clinicians should be aware of the potential of delayed and recurrent symptoms or signs years or even decades after muslin wrapping of aneurysms [7)].

A man with subarachnoid hemorrhage from a fusiform ruptured PICA aneurysm. The technique demonstrated is a far-lateral approach and a clip-wrap technique using muslin gauze. The patient was given aspirin preoperatively in preparation for possible occipital-PICA bypass if direct repair was not feasible. It is the authors' preference to perform direct vessel repair as a primary goal and use bypass techniques when this is not possible. Vessel patency was evaluated after clip-wrapping using intraoperative Doppler. Intraoperative somatosensory and motor evoked potential monitoring is used in such cases. The patient recovered well. The video can be found here: http://youtu.be/iwLqufH47Ds [8)].

Surgeons use muslin gauze in cerebrovascular neurosurgery to wrap around aneurysms or intracranial vessels at risk for bleeding [9)] The thought is that the gauze reinforces the artery and helps prevent rupture. It is often used for aneurysms that, due to their size or shape, cannot be microsurgically clipped or coiled [10)].

In 1990 Haisa et al. published a rare case in which a foreign-body granuloma developed at the site of muslin wrapping and Aron Alpha A coating of an internal carotid artery aneurysm. The importance of avoiding the use of muslin, especially close to the optic nerve and chiasm, is emphasized [11)].

In 1983 Carney and Oatey reported three cases of visual failure of presumably ischemic etiology, after aneurysm surgery; the first case occurring 7 months after clipping and gauze wrapping of a 4-mm anterior communicating artery aneurysm; the second case occurring 8 months after gauze wrapping of a partially intracavernous 10-mm internal carotid artery aneurysm which projected into the right optic foramen; and the third case occurring 11 months after ligation, clipping, and gauze wrapping of an 8-mm internal carotid-posterior communicating artery aneurysm [12)].

Unclassified

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