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Technique

Stitch retractor—simple and easy technique to retract brain

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Abstract

Background: Self-retaining brain retractors are commonly used during intracranial surgery, and they are indispensable during microneurosurgery. There is a common severe complication due to the use of self-held retractors, that is, formation of a hemorrhagic infarct area in the brain region exposed to traction. All the more, present retractor systems are fixed and rigid and obstruct surgeons during surgery. Sometimes these retractors create glare in the microscope that distracts the surgeon. We hereby propose a simple and easy method of retraction of brain especially the temporal lobe using the transsylvian approach and vermis using the transvermian approach.

Methods: This is retrospective analysis of 47 patients in 4 years in which we have used our stitch retractor. We have analyzed their outcome, postoperative scan, and ease of performing surgery.

Results: In 47 patients, there was only 1 postoperative contusion, and the longest period it was kept for is 6 hours. The other advantage was that it does not obstruct in any way while doing dissections and surgery. There was no glare while operating under a microscope.

Conclusion: We hereby propose a simple and easy method of retraction of brain especially the temporal lobe using the transsylvian approach and vermis using the transvermian approach. It is minimally traumatic, reducing insult to the brain. It allows the surgeon to dissect without any obstruction and glare in the way. The biggest advantage of the present stitch retractor is that it is very cheap and simple to use.

Keywords: Stitch retractor; Sylvian fissure; Transsylvian approach; Transvermian approach; Temporal lobe; Brain retraction pressure; Self-retaining brain retractors

1. Introduction

Walter Dandy once wrote while discussing operative technique that "it is evident edema is directly proportional to the amount of insult to the brain during the operation. Gentleness in touching the brain, in traction, in sponging, the use of sharp instruments instead of blunt force in cleavage, are all important in lowering the amount of cerebral edema" [5]. A retractor is an instrument used during surgery for, among other things, holding back structures adjacent to the immediate operative field. During surgery for aneurysms, for lesions located in skull base and sellar- suprasellar tumor where the sylvian fissure is opened, retraction of temporal lobe is required to gain adequate surgical exposure.

At present, many good retractor systems are available. Each system has its own advantages. It is seen that these retractors may cause contusions in the underlying brain. Andrews and Bringas [2] and Andrews and Muto [3] in their study pointed out that approximately 10% of major cranial base tumors and 5% of intracranial aneurysm surgeries have brain retraction injuries. There may even be chances that retraction-related postoperative hematoma can be fatal [11]. Present retractor systems are fixed and rigid, and they also tend to obstruct surgeons' way at times. These retractors may also create glare in the microscope and distract the surgeon. There are various attempts to avoid complications of these

Abbreviations: BRP, brain retraction pressure; CBF, cerebral blood flow; EEG, electroencephalogram; MAP, mean arterial pressure; rCPP, regional cerebral perfusion pressure; SPECT, single photon emission computed tomography; SSEP, somatosensory evoked potential

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with use of sponge pieces as retractors [4], soft microballoon paddy [12], spoon retractor 10, malleable retractor [6], and so on. We have been using this simple and easy method of retraction of brain especially the temporal lobe and cut halves of vermis using the transvermian approach while doing surgery.

1.1. Technique

In our technique, after making the craniotomy, brain protection is extremely important during arachnoidal dissection and brain separation to create a surgical corridor. Once the sylvian fissure is opened, then 4'0 silk on atraumatic needle is taken to pass through the arachnoid of sylvian fissure side of the temporal lobe, which is usually thickened there. After taking the suture, it is tied to skin or temporalis muscle, and the temporal lobe is retracted very gently as shown in Fig. 1. In this way, even without producing retraction, the temporal lobe can be kept away from the operating field to facilitate surgical dissection.

We have also found it quite useful in the intra fourth ventricular tumor surgeries requiring transvermian approach. Using this technique, both halves of the vermis can be kept retracted. It is particularly useful in children where retraction can be quite dangerous to the patient. In Fig. 2, a similar retraction method is shown while doing tumor dissection. Sometimes, to facilitate the suture to stay at the arachnoid where it is thin, it can be coagulated in a little area by using bipolar current at low settings so that the arachnoid becomes thick (Fig. 3).

1.2. Advantages

There are plenty of advantages in the above-described system. The foremost is that there are no chances of postoperative contusion or hematoma. This system has the advantage that it can be kept in use for prolonged time without any trauma. The authors have used this retractor technique since the last 4 years in 47 patients with only 1 postoperative confusion, and the longest period it was kept for is 6 hours. The other advantage is that it does not obstruct in any way while doing dissections and surgery. There is no glare while operating under microscope. The biggest advantage is that it is very cheap, and costs almost nothing; thus, it fulfills the criteria of a good retractor having properties of simple function, wide view, and safety.

1.3. Drawback

When the brain is very full and angry, retraction achieved by this is not enough, so the traditionally used retractor systems are required. In some cases where sylvian fissure is not opened properly or the temporal lobe is lacerated, it cannot be used. It has limited usefulness in the sense that it can be used only for the temporal lobe and transvermian approaches for fourth ventricular surgeries.

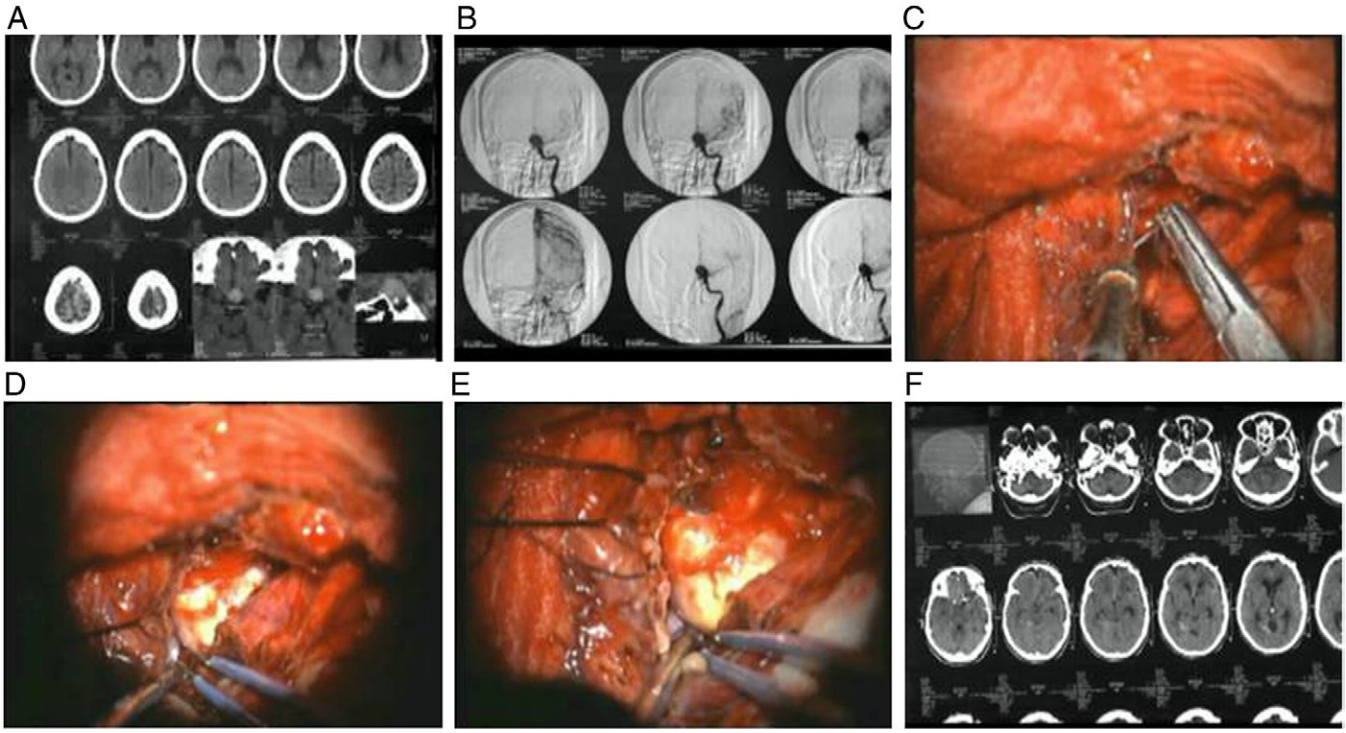

Fig. 1. A: Preoperative scan suggestive of suprasellar lesion. B: Four-vessel angiogram suggestive of ICA aneurysm. C: Stitch being taken from the arachnoid after sylvian fissure dissection. D: Dissection in progress after temporal lobe is being retracted away with stitch retractor. E: Clipping and excision of aneurysm with stitch retractor in situ without any evidence of temporal lobe contusion. F: Postoperative scan.