Retraction system for transsphenoidal surgery

Technical note

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A retraction system has been developed for transsphenoidal surgery to use together with a conventional self-retaining speculum. The system comprises an attachment to the speculum, a self-retaining retractor, and a slim tapered brain spatula and pronged hook. The spatula or hook is secured with the self-retaining retractor and the attachment. The retractor can also be fixed to the Sugita multipurpose head frame. The system may be used to retract the bulging diaphragma sellae and tumor tissues, and to stop bleeding from the dural venous sinus or tumor bed, so the surgeon can continue the procedure with both hands.

KEY WORDS • retractor • transsphenoidal surgery • pituitary tumor • instrumentation

Retraction during craniotomy has been reported for various approaches, however, the only retractor described for transsphenoidal surgery is the self-retaining bivalve speculum used to secure an approach. We describe a retraction technique that we have used around the target area in 30 recent cases involving transsphenoidal procedures for pituitary adenomas, craniopharyngiomas, and chordomas.

Technique

The patient’s head is fixed in the Sugita multipurpose head frame, and a modified Hardy technique is used to approach the sellar region. A slim tapered brain spatula with a tip 2 mm in width, modified from an ordinary tapered brain spatula, is connected to a lightweight self-retaining retractor, and a four-pronged hook retractor is used for harder structures (Fig. 1). The self-retaining retractor is fixed to an extension arm on the base of the speculum (Fig. 2). There are two extension arms so that two self-retaining retractors can be held simultaneously. The retractors can also be fixed to the multipurpose head frame.

This retraction system is particularly useful for removal of large pituitary adenomas, especially when there is suprasellar extension. In such cases, the sella is approached transsphenoidally. The enlarged sella is opened and a substantial portion of the tumor mass is removed by suction and curette. Residual tumor tissues are then removed, with the medially bulging dural wall retracted laterally by the tapered spatula. The diaphragm, which bulges downward, is retracted to remove the extrasellar portion of the tumor. If excessive bleeding is encountered from venous channels close to the cavernous sinus or from the tumor tissues, it can be controlled by pressing or holding the bleeding point with the tip of a spatula over a piece of Oxycel and cottonoid. The operative procedure can continue without delay.

Illustrative Case

This 67-year-old woman was found to have bitemporal hemianopsia caused by a calcified suprasellar...
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FIG. 2. Operative views. Left: A slim tapered spatula is in place, held with a light-weight self-retaining retractor and the extension arm fixed to the speculum. Note that two retractors can be used. Right: Self-retaining retractors are fixed to the circular frame of the multipurpose head frame. Two spatulas are in use.

Discussion

Retraction during transsphenoidal procedures is difficult because of the narrow space created by the speculum. Furthermore, the surgeon cannot expect much help from his assistant in such a narrow cylindrical space. The methods of retraction that we have used are simple: one is to use supplementary extension arms attached to the base of the speculum, and the other is to utilize the multipurpose head frame. The latter method is applicable when the head frame is being used for craniotomy procedures. Generally, this method provides steadier retraction from various angles in a narrow operative field, because a self-retaining retractor can be set anywhere around the circular frame. We therefore use this system more often.

Because of the narrow field, a slim tapered brain spatula, 2 mm wide at the tip, is most useful. The long slim tapered spatula is used for retracting membranous or soft tumor tissues; when the diaphragm is retracted, a small cotton patty is placed between the tip of the spatula and the diaphragm to prevent injury to it. Of course, drainage of cerebrospinal fluid would further facilitate visualization of the suprasellar portion of the tumor. A four-pronged hook retractor is useful for hard tumor tissues or fibrous materials. Two retractors can be attached to the extension arms on the speculum, and both can be used simultaneously if necessary.

FIG. 3. Schematic drawing of the operative field in excision of a calcified craniopharyngioma. The diaphragma sellae (a) and pituitary gland (c) are retracted by spatulas (e), and the calcified tumor (b) is removed with a punch (d).
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References


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