Anterior approach to recurrent chordomas of the clivus

Technical note

A. N. GUTHKELCH, F.R.C.S., AND R. G. WILLIAMS, F.R.C.S.
Combined Neurological Service and the Department of Ear, Nose and Throat Surgery, Hull Royal Infirmary, Hull, England

A modified transpalatal transclival approach was used for removal of two recurrent tumors of the clivus. New features of the exposure include placing the mucosal incision immediately behind the line of the upper teeth, removal of the posterior third of the hard palate, increased mobilization of the soft palate, and removing the posterior ends of the inferior turbinals.

Key Words • chordoma • clivus tumors • technique • tumor recurrence

LONG-TERM remission of symptoms in cases of chordoma of the clivus can be achieved by subtotal removal of the tumor using the transtemporal or parietooccipital routes. However, these approaches necessarily involve dissection among the cranial nerves as well as prolonged retraction of the temporal lobe, with a risk of damage to these structures or to the cerebral peduncle. Since chordomas are extradural tumors, one might hope to approach them extradurally; when the tumor originates within the basisphenoid this can only be achieved by an anterior route. However, until now the reports have been discouraging. When Zoltán and Fényes collected records of eight cases of attempted extirpation of clivus chordomas through the nose, antrum, or palate, they found that only two patients had enjoyed a worthwhile period of remission (1 and 1½ years respectively); death or early recurrence was the commonest sequel.

Wilson has shown that if transpalatal access to the back of the nasopharynx is performed by detaching the soft from the hard palate by a transverse incision, the resulting scar leaves no disability. Mullan, et al., used this approach to remove an intradural meningioma arising from the anterior lip of the foramen magnum and a chordoma of the body of the axis. Stimulated by the latter report we used this method in two cases of recurrent chordoma of the clivus, incorporating some modifications designed to improve exposure of the posterior wall of the nasopharynx.

Technique

Before the operation, the patient is fitted with a palatal shield made of acrylic resin. Following preliminary tracheostomy, an incision is made along the palatal mucosa following the line of the upper teeth and extending posteriorly over the medial surface of the tuberosity of the maxilla to terminate in the interval between the pterygo-mandibular raphe and the pterygoid hamulus on each side (Fig. 1 left).
Anterior approach to chordomas of clivus

A subperiosteal flap of palatal mucosa is reflected backward to the junction of the soft with the hard palate, exposing the greater palatine foramina. The pterygoid hamuli are divided with stout scissors so as to relax the tensor palati muscles, after which their aponeurosis is separated from the posterior edge of the hard palate, permitting the soft palate to drop toward the tongue. Further mobilization of the soft palate is achieved by removing the thin plate of bone which constitutes the posterior wall of the greater palatine canal for a distance of about 1 cm, preserving the greater palatine vessels and nerve in their fascial sheath. This separation of the vascular bundle allows depression of the soft palate by an additional 1 to 2 cm. Access to the nasopharynx is increased by removing about one third of the posterior part of the hard palate with rongeurs, and amputating the posterior thirds of the inferior turbinals and the posterior portion of the nasal septum.

The posterior wall of the nasopharynx is incised in the midline and flaps of mucosa, muscle, and pericranium dissected back in such a way as to expose the posterior end of the sphenoid air sinus, the basisphenoid, and the basiocciput, these flaps being temporarily sutured by the margins of the palatal incision. The resulting exposure is shown diagrammatically (Fig. 1 right).

With the use of a dental drill, the base of the skull is now perforated to expose the tumor, and further bone nibbled or burred away until the base of the latter has been exposed. The tumor itself is then extracted, preserving the dura wherever possible. The latter however may be deficient in places and should be protected by strips of gelatin sponge before closure of the pharyngeal mucoperiosteal flaps with interrupted silk sutures.

When all visible tumor tissue has been removed, the nasopharynx is firmly packed with gauze soaked in Bismuth-Iodoform-Paraffin Paste to obliterate dead space, and the palatal flap sutured back into position. The suture line is protected by an acrylic palatal shield. The pack and shield are not removed before the 10th postoperative day.

We have used this approach for the successful removal of clivus chordomas in two
patients. Both were young men who have so far survived without signs of recurrence for 3 and 2 years respectively. The first patient was in good condition preoperatively, complaining only of diplopia and headaches, and it was possible to remove his tracheostomy on the day after operation. There was some rhinorrhea for 4 days but no evidence of infection. The second patient was in a critical condition; he had papilledema, multiple lower cranial nerve palsies, aphasia, and was quadriparietic. His tracheostomy was retained until the 10th day. Both these patients have made uninterrupted recoveries; neurological deficits have disappeared and they have returned to full work.

Discussion

The new steps in the exposure of the anterior aspect of the clivus which we recommend are as follows:

1. Place the mucosal incision immediately behind the line of the upper teeth. Use a palatal shield to protect the intraoral suture line.

2. Remove the posterior third of the hard palate and the posterior end of the inferior turbinals to provide better access to the nasopharynx.

3. Resect the posterior walls of the greater palatine canals to increase mobilization of the palatal flap, thus avoiding the need for strong retraction.

These modifications in exposure also mitigate the possibility of postoperative edema of the mouth and pharynx, a complication which did not occur in either of our patients. The transoral approach involves a much less taxing preliminary dissection than the transcervical route advocated by Stevenson and his colleagues. Although the latter avoids the risk of infection associated with working through the pharynx, our limited experience indicates that this complication can be avoided when the transoral route is used, even if the dura has been opened.

Acknowledgments

We wish to acknowledge the help of Drs. B. J. Hovell and J. L. Webster who gave the anesthetics, and of Mr. S. R. Woodcock who made the acrylic shields. The diagrams were prepared by the Audio-visual Aids Centre of Hull University.

References


Address reprint requests to: Mr. A. N. Guthkelch, Neurosurgical Service, Hull Royal Infirmary, Hull, England.