



Use of Translabellar-Transethmoidal Endoscopy to Remove Large or Giant Tumors of the Sellar Region

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Introduction

Most neurosurgeons choose to employ a transphenoid approach when removing giant tumors located in the sellar region of the brain. However, the question of whether the removal of such large, firm tumors may be as well or better accomplished through an approach using translabellar-transethmoidal (TGL-TE) endoscopy remains unanswered. We have previously reported our experience with TGL-TE and concluded that this technique can accommodate the range of surgical manipulations required to remove large or giant sellar tumors. We have continued this work in order to evaluate more precisely the anatomical and surgical parameters of TGL-TE.

Materials and Methods

To plot the maximal points of possible approach extension during each stage of bone resection, we first performed TGL-TE endoscopy on 15 cadaver heads. We measured wound depth, the angles of surgical action in the axial and sagittal planes, and the area of base resection. Subsequently, between January 2005 and May 2007, we performed 33 operations to remove large (22) or giant (11) tumors from patients. Of these tumors, 22 were pituitary adenomas, 5 were craniopharyngiomas, 2 were chondrosarcomas, 3 were meningiomas, and 2 were dermoid tumors.

Results

The ranges of selected critical anatomical points that would allow bone resection measured as follows. The maximum wound depth at the level of the medial third of the clivus was 9.00 ± 0.41 cm from the nasion. We noted that the angle of surgical action decreased as the wound

became deeper, moving from 180 degrees at the skin surface to an average of 20 ± 1.2 degrees at the deepest part of the wound. The minimum angle of surgical action was 12 degrees at the level of the medial third of the clivus. At the anterior (I) approach extension (tuberculum sella resection, planum sphenoidale and lamina cribrosa), the optimal angle of the surgical attack line was 70 degrees relative to the optical axis of the microscope. At the posterior (II) approach extension (dorsum sella resection, and upper third of the clivus), the optimal angle was 105 degrees, and at the lateral (III) approach extension (resection of lateral wall of sphenoid sinus, intracavernous dissection), the maximum optical axis deflection from the sagittal plane was 15 degrees. The average size of the resection area at the base of the skull was 6.14 ± 0.98 cm² for the type I extension; 5.21 ± 1.04 cm² for the type II extension; and 2.48 ± 1.12 cm² for the type III extension. We achieved complete tumor removal in 21 cases, greater than 70 percent removal of the total tumor mass in 11 cases, and less than 70 percent removal in 1 case.

Conclusions

Our surgical results demonstrate that infrasellar tumor removal is eminently feasible even when the tumor mass is firm. TGL-TE extension approach types I, II, and III permit the reliable and safe removal of supra-, ante-, retro- and parasellar sections of tumors. An endoscope extension is necessary for lateral extension.