Orbitofacial Masses in Children

An Endoscopic Approach

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Objective: To describe an endoscopic approach for pediatric orbitofacial masses.

Design: A retrospective medical chart review.

Setting: Tertiary-care children’s hospital.

Participants: Patients (4 boys, 7 girls) ranged in age from 6 months to 11 years. All children underwent endoscopic excision of an orbitofacial mass.

Intervention: A single port approach was used in all but the initial case. The scalp incision was placed approximately 2.0 cm behind the frontal hairline. A subgaleal dissection was performed to minimize risk of nerve injury. Under endoscopic visualization, the mass was resected.

Main Outcome Measures: Ability to successfully excise the mass endoscopically, and the incidence of complication.

Results: All lesions were successfully resected endoscopically. The surgical time varied from 30 to 105 minutes (mean, 50.5 minutes). Pathologic examination revealed 10 dermoid cysts and 1 neurofibroma. Two children had transient frontal branch palsies that resolved spontaneously. There was 1 unilateral frontal hypoesthesia in the patient with the neurofibroma (an expected result). There were no other complications.

Conclusions: An endoscopic approach to pediatric orbitofacial tumors is safe and effective. Although the risk of nerve injury may be higher, a thorough knowledge of frontotemporal anatomy and careful dissection will minimize this risk. The distinct advantage of an endoscopic approach is the absence of any facial scar in these young patients.

dures performed by the surgeon increased. Pathologic examination revealed 10 dermoid cysts and 1 neurofibroma. The neurofibroma was removed from the left superior medial brow of an 11-year-old girl. Further workup for von Recklinghausen disease was negative. The remaining patients ranged in age from 6 to 30 months (average, 13.1 months) with the eyebrow dermoid being the most common presentation. While some pathologists have classified epidermoid and dermoid cysts together, we considered only those lesions that contained skin appendages in addition to cutaneous epithelium as true dermoids.2 All patients healed well with an aesthetically pleasing, hidden scar (Figure 4). There were no perioperative infections or fluid collections, however, 2 important complications must be noted. A transient frontalis branch paresis was noted in 2 patients. The first patient was a 6-month-old girl who had a dermoid cyst removed from the right superior lateral orbit. A lateral approach was used on this patient, which probably induced a stretch injury of the frontalis branch of the facial nerve. Complete recovery was evident 2 months postoperatively. A temporary frontalis paresis was also noted in an 11-month-old girl after dermoid removal from the left superior lateral brow. Forehead hypoesthesia was noted postoperatively in the 11-year-old patient who presented with the neurofibroma. This neurofibroma involved either the supratrochlear and supraorbital nerves medially and the frontal branch of the facial nerve laterally. The endoscopic setup included a 6-mm 30° endoscope, a xenon light source, and video camera with monitor. Under endoscopic visualization, the dissection was completed until the dermoid was well circumscribed. A combination of sharp and blunt dissection with the microscissors and perioveal elevators was used to free the peristeum overlying the mass and to remove the intact lesion. In most cases, there was a scalloped depression in the underlying bone (Figure 3). After copious irrigation, the wound was closed primarily, and all patients were discharged on the day of surgery.

## PATIENTS AND METHODS

From September 1, 1997, to February 28, 2001, 11 patients underwent endoscopic excision of an orbitofacial mass at The Children’s Hospital of New Orleans. There were 7 girls and 4 boys with ages ranging from 6 months to 11 years at the time of surgery, with a mean age of 24.7 months. The most common location for these lesions was the eyebrow (n = 7) followed by the orbit (n = 2) and nasoglabellar area (n = 2). All patients with a midline nasoglabellar lesion had preoperative computed tomography scans to rule out possible intracranial extension.

After discussing the risks of the endoscopic approach vs the traditional open approach, informed consent was obtained from the parent or guardian and the patient was taken to the operating theatre. Depending on the location of the lesion, a 1.5- to 2.0-cm incision was created cephalad to the mass, at least 2 cm behind the hairline (Figure 1). A single port approach was used in all cases but the first one, in which both midline and temporal incisions were used to remove a mass from the left superior lateral brow. The scalp incision was carried down to the subgaleal plane. Spreading dissection in the subgaleal plane continued to cephalad to the mass, at which time the endoscope was inserted (Figure 2). Care was taken to stay directly on the peristeum or deep temporalis fascia to minimize the risk of injury to the supratrochlear and supraorbital nerves medially and the frontal branch of the facial nerve laterally. The endoscopic setup included a 6-mm 30° endoscope, a xenon light source, and video camera with monitor. Under endoscopic visualization, the dissection was completed until the dermoid was well circumscribed. A combination of sharp and blunt dissection with the microscissors and periosteal elevators was used to free the peristeum overlying the mass and to remove the intact lesion. In most cases, there was a scalloped depression in the underlying bone (Figure 3). After copious irrigation, the wound was closed primarily, and all patients were discharged on the day of surgery.

Dermoid cysts in children are commonly found in the head and neck region, accounting for up to 84% of the total body dermoids in 1 study.3 The orbital and periorbital location is the most frequent site of involvement, with the neck, scalp,
Spicuous facial scar. The greater tendency toward hypertrophic scarring in the pediatric population provides further incentive to use a minimally invasive approach. This cosmetic advantage is especially evident when compared with the coronal approach for a forehead lesion. In our original description of endoscopically assisted dermoid excision, Huang et al used a 2-port approach, with 1 temporal incision and 1 incision cephalad to the lesion behind the hairline. We used a single-port approach in all cases but the first one to minimize the number of scars.

The primary disadvantage of an endoscopically assisted surgical approach is the increased risk of sensory and facial nerve injury. When the lesion is located laterally, the temporalis branch of the facial nerve is at increased risk for injury. In our series, 2 of 7 patients with laterally based lesions had a transient postoperative temporalis branch paresis. This was most likely secondary to stretching of the nerve by the endoscope, while elevating the overlying flap. Another disadvantage is the potentially higher cost of the procedure secondary to use of the endoscopic equipment and longer operative times early in the learning process. However, we noted a trend toward decreased operative time as the number of procedures performed increased. Some authors may argue that the use of this procedure is not necessary for small lesions around the eyebrow or orbit, but we believe that the absence of an appreciable facial scar is a significant advantage and outweighs the risks of nerve injury.

A thorough knowledge of the anatomy of this region is necessary to minimize the risk of nerve damage. The frontalis branch of the facial nerve courses diagonally upward across the zygomatic arch in the temporal region to enter the frontalis muscle above the superior orbital rim. It courses within the superficial temporal fascia, which is continuous with the superficial musculoaponeurotic system inferiorly, the galea superiorly, and the frontalis muscle anteriorly. Dissection directly on top of the deep temporal fascia laterally, and the periosseum medially will avoid injury to the frontalis branch. The supratrochlear nerve and superficial branch of the supraorbital nerve can be avoided with safe subgaleal dissection to within 2 cm of the supraorbital rim. The location of the supraorbital foramen is variable and may occur up to 1.9 cm above the supraorbital rim. Therefore any dissection within 2 cm of the supraorbital rim
Figure 4. Before (A and B) and after (C and D) photographs of child with lateral brow dermoid.
should be done carefully under direct visualization. The deep branch of the supraorbital nerve, however, is prone to injury with subgaleal dissection. Damage to this nerve accounts for the paresthesias noted in the frontoparietal scalp after traditional coronal forehead-brow lift. This branch runs in the subgaleal plane parallel and medial to the superior temporal line. To avoid damaging this branch, dissection in the subperiosteal plane is advised during forehead or brow lifting. It is difficult to know if this branch was damaged during our dissection secondarily to the young age of our patients.

In conclusion, we have successfully resected orbitofacial masses using an endoscopically assisted approach in a small series of pediatric patients. Our results correlate well with those published previously. This technique is both safe and effective, while providing a superior cosmetic result compared with the traditional approach. Although the potential risk of nerve injury is increased, a thorough knowledge of frontotemporal anatomy will minimize this risk. We believe that the absence of a conspicuous facial scar provides a cosmetic advantage that outweighs the potential risk of this approach.

Accepted for publication September 14, 2001.

This study was presented at the American Society of Pediatric Otolaryngology Meeting, Scottsdale, Ariz, May 11, 2001.

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REFERENCES