ABSTRACT

Objective: To highlight the surgical approaches and cosmetic considerations involved in the management of pediatric nasofrontal dermoid cysts. We reviewed the various surgical approaches in comparison to our own experience utilizing the vertical midline incision.

Methods: Case series of 4 different types of nasal dermoids including one with an intracranial extension managed at a single tertiary medical center.

Results: There were a total of 4 patients. The mean age at surgery was 2.5 years. The anatomic location of the nasal dermoids differed in each patient: (1) supratip, (2) upper dorsum, (3) tip and supra-tip, (4) tip and upper dorsum. CT and MR imaging was performed on all patients confirming a hyper-intense lesion on T1 and hypo-intensity on T2 weighted imaging. CT also demonstrated an bidual crista galli and enlarged foramen cecum in the case of intracranial extension. All four patients underwent surgical removal of the lesions with excision of involved skin utilizing the vertical midline incision. Nasal reconstruction was performed with local soft tissue advancement flaps (1 patient), Alloderm® (2 patients) and fat. CT and MR imaging performed on all patients confirming a complete resection and no complications or recurrences. All patients had a cosmetically acceptable incisional scar.

DISCUSSION

Nasal dermoid anomalies can present as midline masses, tracts or a combination of both. Early, complete surgical resection is recommended to prevent complications, structural distortion and recurrence. We do not recommend adhesions should adhere to four main principles: allow exposure to the mass and associated sinus tract, allow access to the skull base, provide exposure for reconstruction of the nasal dorsum and support a cosmetically acceptable scar. The vertical midline approach has been widely supported in previous literature, but has since become less desired for fear of unsatisfactory scar. Since then, alternative techniques such as the open and closed rhinoplasty as well as endoscopy have been utilized in efforts to avoid such complications. While these approaches have their advantages they tend to be more invasive and do not negate an elliptical excision of involved skin along the nasal dorsum. In our experience, minor extension of this incision in the cranio-caudal direction allowed for adequate exposure of the mass and sinus tract in its entirety without excessive manipulation of uninvolved tissue. This held true for each of our patients who presented in anatomically distinct regions of the naso-glabella, including the case with intracranial extension (shown in figures 1-4). Local reconstruction of the nasal dorsum and overlying skin was easily achieved in all patients resulting in a functional nasal aperture, cosmetically acceptable scar and no obvious external nasal deformity.

CONCLUSIONS

There are many options for the surgical management of midline congenital nasal lesions. It should be individualized based on the extent of the disease with input from a multidisciplinary team. Those with a visible pit or infective cutaneous involvement necessitate excision of the overlying skin and possibly underlying cartilage and bone. In these cases the vertical midline approach provides wide exposure for complete excision and reconstruction of lesions in the region from the glabella to the nasal tip. This approach also results in a cosmetically acceptable scar without external nasal deformity.

REFERENCES


INTRODUCTION

Congenital midline nasal lesions are rare and have been reported to occur in approximately 1:30,000 [1]. These lesions commonly include encephaloceles, gliomas, and hemangiomas, but are largely comprised of nasofrontal dermoid cysts (NDC). NDC’s are true cysts containing keratinizing squamous epithelium and adnexal structures. They are thought to arise from incomplete separation of neuro-ectodermal and ecdetermal tissue during development of the anterior skull base. Presentation usually occurs at a young age as a nasal mass along the dorsum or glabella. Up to 50% of these lesions involve the skin and 20% may extend intra-cranially[2]. NDC’s are susceptible to recurrent infections and may progress to osteomyelitis, meningitis or intracranial abscesses. Moreover, they can cause significant disfigurement and warrant prompt evaluation. High resolution, multi-planar imaging modalities (CT and MRI) are required for pre-operative planning and to rule out intracranial extension. Recommended treatment is complete surgical excision. Many surgical approaches have been described including: midline vertical, open rhinoplasty, Lynch, gullwing, and coronal incisions as well as endoscopic techniques. While planning the surgical strategy, it is crucial to consider the location and extent of the lesion as deeper lesions may require more invasive techniques. Adequate exposure must be achieved for excision and exploration to reduce the risk of recurrence, which has been reported from 50-100% if resection is incomplete[3]. Obtaining acceptable cosmesis, and concerns about the effect of the procedure on long term growth, adds to the complexity of treating this entity in the pediatric population. The objective of our study is to describe our experience with the midline vertical incision in achieving these goals as compared to other surgical approaches.

METHODS AND MATERIALS

This was a retrospective review of 4 patients who presented to a single, tertiary institution between the dates June, 2010 to July, 2012. All four had the final pathologic diagnosis of nasofrontal dermoid cysts, one had intracranial extension. All cases underwent pre-operative imaging with high resolution, multiplanar CT, MRI or both. Each patient was treated with a vertical midline approach and excision followed by local reconstruction. A coronal incision with frontal craniotomy was also utilized in the case with intracranial extension. All patients received long term post operative evaluation by their primary surgeon.

RESULTS

There were a total of 4 patients (2 male, 2 female) that presented with a midline nasal mass with cutaneous involvement. The mean age at presentation was 1 year. The mean age at surgery was 2.5 years. The anatomic location of the nasal dermoids differed in each patient: (1) supratip, (2) upper dorsum, (3) tip and supra-tip, (4) tip and upper dorsum. MR imaging was performed on all patients confirming a hyper-intense lesion on T1 and hypo-intensity on T2 weighted imaging. CT also demonstrated an bidual crista galli and enlarged foramen cecum in the case of intracranial extension. All four patients underwent surgical removal of the lesions with excision of involved skin utilizing the vertical midline incision. Nasal reconstruction was performed with local soft tissue advancement flaps (1 patient), Alloderm® (2 patients) and bone dust pate (1 patient). The patient with intracranial involvement also underwent a frontal craniotomy to excise the intracranial component. All 4 lesions were histologically confirmed as dermoid cysts. Mean follow-up was 1.5 years. There were no complications or recurrences. All patients had a cosmetically acceptable incisional scar.

CONCLUSIONS

There are many options for the surgical management of midline congenital nasal lesions. It should be individualized based on the extent of the disease with input from a multidisciplinary team. Those with a visible pit or infective cutaneous involvement necessitate excision of the overlying skin and possibly underlying cartilage and bone. In these cases the vertical midline approach provides wide exposure for complete excision and reconstruction of lesions in the region from the glabella to the nasal tip. This approach also results in a cosmetically acceptable scar without external nasal deformity.

Table 1. Patient Statistics.

<table>
<thead>
<tr>
<th>Age @ P</th>
<th>Age @ S</th>
<th>location</th>
<th>Intracranial</th>
<th>Recurrence</th>
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<tr>
<td>Patient 1</td>
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<td>Patient 2</td>
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<td>14 month</td>
<td>Glabella</td>
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<tr>
<td>Patient 3</td>
<td>Birth</td>
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<td>Tip</td>
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</tr>
<tr>
<td>Patient 4</td>
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<td>3 years</td>
<td>Dorsum</td>
<td>Yes</td>
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