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Plastic & Reconstructive Surgery

LARGE NASAL DERMOID CYST WITH PROGRESSIVE NASAL DISTORTION IN A CHILD: MINIMALLY INVASIVE LATERAL WALL EXCISION WITH CAPSULECTOMY - A CASE REPORT AND REVIEW OF LITERATURE

KEY WORDS: nasal dermoid cyst; paediatric; nasal distortion; lateral wall incision; capsulectomy; cyst decompression; congenital midline nasal lesion; nasal dorsum

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ABSTRACT	Background: Nasal dermoid cysts are congenital midline lesions arising from ectodermal elements sequestered along embryological fusion planes. Although typically presenting as small, static lumps, they can enlarge progressively during childhood and produce significant distortion of the nasal contour. Their surgical management requires complete capsule removal to prevent recurrence while minimising scar visibility and preserving nasal form. A minimally invasive lateral wall incision with controlled cyst decompression and capsulectomy offers a viable surgical strategy in selected cases. Case Presentation: We report a 10-year-old male who presented to the plastic surgery outpatient department with a four-year history of a progressively enlarging midline swelling over the nasal dorsum that had grown sufficiently large to visibly distort the shape of the nose. Magnetic resonance imaging confirmed a well-defined, non-enhancing dermoid cyst without intracranial extension. Surgical excision was performed through a vertical incision placed over the lateral wall of the nose. The cyst was encountered and, upon dissection, ruptured; its keratinous and sebaceous contents were thoroughly suctioned, and the cyst capsule was subsequently identified, dissected free, and removed in its entirety through the same incision. Wound closure was achieved primarily. The patient achieved complete wound healing and a satisfactory nasal contour at follow-up, with no evidence of recurrence at twelve months. Conclusion: A vertical lateral wall incision with controlled decompression and complete capsulectomy represents a practical and effective surgical approach for large nasal dermoid cysts causing nasal distortion in children. The technique avoids conspicuous midline dorsal scarring, allows adequate access for capsule removal, and yields acceptable cosmetic outcomes when combined with meticulous wound closure.
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INTRODUCTION Dermoid cysts of the nasal dorsum are rare congenital lesions, occurring in approximately 1 in 20,000 to 1 in 40,000 live births and constituting nearly 12% of all dermoid occurring in the head and neck region ^[1,2]. They arise from the faulty separation of the dural diverticulum from the nasal skin during the eighth week of embryogenesis, resulting in the sequestration of ectodermal elements including skin, hair follicles, and sebaceous glands along the midline nasal fusion plane ^[3]. The clinical presentation is characteristically that of a firm, midline, slowly enlarging nasal dorsal swelling, occasionally associated with a hair-bearing punctum, sebaceous discharge, or episodic infection ^[4]. While many nasal dermoid cysts are identified and treated early in childhood when they are small, some patients present late with large lesions that have expanded progressively over years, altering the overlying nasal soft tissue envelope and distorting the nasal contour. These larger lesions present a distinctive surgical challenge: the surgeon must achieve complete removal of the cyst and its capsule since any residual epithelial lining carries a high risk of recurrence while simultaneously preserving the cosmetically critical nasal form and avoiding conspicuous scarring in this highly visible anatomical region ^[5,6]. Multiple surgical approaches have been described for nasal dermoid excision, including direct elliptical excision, open rhinoplasty trans columellar approach, external dorsal incisions, and endoscopic techniques ^[7,8]. The choice of approach must be individualised to the size and location of	the cyst, the degree of nasal distortion, and the surgeon's familiarity with nasal anatomy. In cases where cyst rupture occurs intraoperatively, complete capsulectomy becomes the operative priority, as retained capsular epithelium is the principal determinant of recurrence ^[9]. We describe a case of a large nasal dermoid cyst in a 10-year-old boy causing significant nasal distortion, managed through a vertical incision over the lateral nasal wall with intraoperative decompression and complete capsulectomy. We discuss the rationale for incision placement, the management of intraoperative cyst rupture, and the technical steps that ensured complete capsule removal through a single, laterally placed incision. CASE REPORT A 10-year-old male was brought to the plastic surgery outpatient department by his parents with a chief complaint of a progressively enlarging swelling over the bridge of the nose of approximately four years' duration. The swelling had been noticed when the child was six years old as a small, inconspicuous midline nasal lump; over the subsequent four years, it had grown steadily and was now of sufficient size to visibly broaden and elevate the nasal dorsum, causing noticeable distortion of the nasal shape. The child had experienced increasing social discomfort as a consequence of his altered appearance. Figure 1: Pre Operative Image of the Nasal Dermoid Cyst [original]
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There was no history of pain, erythema, discharge, or previous episodes of infection at the swelling site. No punctum or sinus opening was identified by the parents or on prior clinical assessment. The child had no history of trauma, prior surgery, or any relevant family history. His growth and development were normal for his age.

On examination, a solitary, midline, smooth, hemispherical swelling was noted over the nasal dorsum, measuring approximately 3.5 x 2.5 cm. The overlying skin was intact, without punctum, sinus tract, or discharging opening. The mass was firm to cystic in consistency, non-tender, non-pulsatile, and non-compressible. It did not transilluminate. The swelling had produced visible broadening and flattening of the nasal dorsum with loss of dorsal definition, altering the nasal profile on both frontal and lateral views. Bilateral nasal patency was intact, and there were no signs of orbital involvement or neurological deficit.

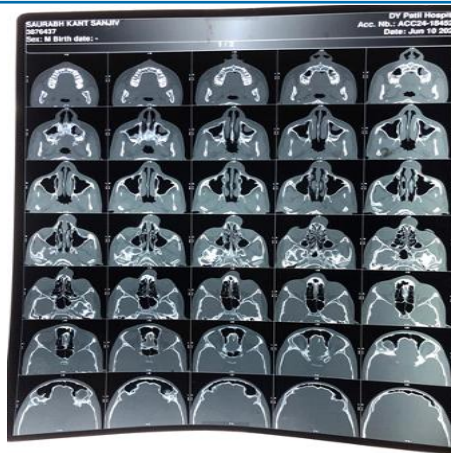


Figure 2: Pre Operative Image Of Nasal Dermoid Cyst Lateral View [original]

Magnetic resonance imaging (MRI) of the nose and paranasal sinuses with contrast was performed and demonstrated a well-defined, T2-hyperintense, T1-hypointense, non-enhancing cystic lesion measuring 3.4 x 2.3 x 2.0 cm in the subcutaneous and subperiosteal plane of the nasal dorsum. The lesion overlay the nasal bones and upper lateral cartilages. There was no bony erosion, no widening of the foramen cecum, and no evidence of intracranial extension. The findings were consistent with a dermoid cyst confined entirely to the extra nasal compartment.

With intracranial extension excluded and parental consent obtained, the patient was scheduled for elective surgical excision under general anaesthesia.

Figure 3: CT Image of Dermoid Cyst [original]



Operative Technique

The patient was placed supine under general anaesthesia with oral endotracheal intubation. The face was prepared with povidone-iodine solution and draped in a standard sterile fashion. Eye protection was applied. Prophylactic intravenous cefazolin was administered at induction. Adrenaline-containing local anaesthetic (1:200,000 epinephrine in 1% lignocaine) was infiltrated subcutaneously in the operative field to aid haemostasis.

A vertical skin incision was planned and executed over the lateral wall of the nose, placed at the junction of the nasal dorsum and lateral nasal sidewall on the side providing the most direct access to the cyst bulk. This incision placement was chosen to avoid a conspicuous midline dorsal scar, to exploit the natural shadow lines of the nasal sidewall for scar camouflage, and to provide a direct working corridor to the lateral and deep aspects of the cyst. The incision measured approximately 2.5 cm in length.

Dissection was carried through the dermis and subcutaneous tissue. As the dissection approached the cyst wall, the capsule was inadvertently breached and the cyst ruptured. The cyst released a viscous mixture of keratinous and sebaceous material, characteristic of dermoid cyst contents. This material was immediately and thoroughly evacuated using suction irrigation, and the operative field was copiously washed with normal saline to prevent implantation of epithelial contents in the surrounding tissues, which carries a risk of secondary implantation cysts and contributes to recurrence.



Figure 4: Intra Operative Image of the Incision and drainage of cyst [original]

Following complete evacuation of the cyst contents, the deflated cyst capsule became clearly identifiable as a distinct, pearlescent, pliable membrane. Attention was then directed entirely to meticulous capsulectomy. Using fine

tenotomy scissors and bipolar electrocautery, the capsule was systematically dissected free from its surrounding tissue attachments superiorly from the undersurface of the nasal skin, and inferiorly from the periosteum of the nasal bones and the perichondrium of the upper lateral cartilages, both of which were kept intact throughout. The dissection proceeded circumferentially, and the capsule was delivered in its entirety through the lateral wall incision. Careful inspection of the residual surgical cavity confirmed no visible remnant of capsular epithelium. The wound was once again irrigated with saline.

There was no identifiable deep tract extending toward the nasal bones or foramen cecum, consistent with the preoperative MRI findings. The periosteum and perichondrium were intact and undisturbed. Haemostasis was secured with bipolar electrocautery. The wound was closed in layers: the subcutaneous layer with interrupted 4-0 absorbable polyglactin sutures and the skin with interrupted 5-0 nylon sutures. No drain was placed. A light compressive nasal dressing was applied.

The excised cyst wall and contents were submitted for histopathological examination, which confirmed a dermoid cyst lined by keratinising stratified squamous epithelium with underlying adnexal structures comprising hair follicles and sebaceous glands. The lumen contained laminated keratin and amorphous sebaceous debris. No malignant features were identified. Surgical margins of the capsule were clear of residual epithelial lining.

The postoperative period was uncomplicated. Sutures were removed at ten days. Postoperative oedema at the nasal sidewall incision site resolved progressively over three to four weeks. At the one-month review, the nasal contour had been restored with a smooth dorsal profile, and the lateral wall scar was healing well and inconspicuous within the nasal sidewall shadow. At twelve-month follow-up, there was no clinical evidence of recurrence, the scar was barely perceptible, and the nasal shape was age-appropriate and satisfactory.

DISCUSSION

The surgical management of nasal dermoid cysts is governed by two non-negotiable principles: complete removal of all capsular epithelium to prevent recurrence, and minimisation of cosmetically visible scarring in this aesthetically critical region^[5,6]. These two goals are complementary rather than competing, and the choice of surgical approach should be guided by which incision provides the safest route to complete capsulectomy while leaving the least conspicuous scar. In this case, a vertical incision placed over the lateral nasal wall fulfilled both criteria.

The lateral wall incision has a distinct advantage over dorsal midline approaches in terms of scar visibility. The nasal dorsum, particularly in children with thin nasal skin, is a region where even well-healed scars may remain perceptible for years and attract attention in a cosmetically prominent location. By contrast, an incision placed along the lateral nasal wall falls naturally within the shadow of the nasal sidewall, where it is optically concealed by the three-dimensional curvature of the nose and where the thicker sidewall skin heals with a more forgiving scar^[10]. For a child who will live with this scar for decades, this consideration is not trivial.

Intraoperative cyst rupture, as occurred in this case, is a recognised event during dermoid cyst excision and has historically been associated with increased recurrence risk^[9,11]. The basis for this concern is the potential for spilled epithelial contents specifically viable epidermal cells to be implanted in the wound bed, where they may seed secondary cysts. However, it is now well established that the primary determinant of recurrence is not rupture per se, but the

completeness of capsule removal^[12]. A ruptured cyst from which the entire capsule is subsequently removed meticulously carries no greater recurrence risk than an intact excision, provided the wound is thoroughly irrigated to clear spilled contents. Conversely, an intact excision in which even a small fragment of capsular epithelium is inadvertently left behind will recur regardless of whether the cyst ruptured.

This principle guided our management following the intraoperative rupture: the contents were immediately suctioned and the field irrigated, and thereafter all operative attention shifted to the identification and complete removal of the capsule. The deflation of the cyst following rupture is, paradoxically, an advantage in this setting it renders the capsule more pliable, reduces the space it occupies, and makes the capsule-tissue interface more clearly defined, facilitating its identification and dissection through the limited lateral wall incision^[13]. This is an important technical point that surgeons should be aware of when managing inadvertent intraoperative rupture: rather than abandoning a minimally invasive approach and extending the incision in panic, controlled, systematic capsulectomy can often be completed through the original incision once the contents are evacuated.

Preservation of the periosteum and perichondrium overlying the nasal skeleton is another technical priority that bears emphasis. In a growing child, the nasal skeleton continues to develop until late adolescence, and any disruption of the periosteal and perichondria sleeves that guide this growth may lead to progressive nasal deformity over the subsequent years^[14]. By keeping dissection immediately on the cyst capsule and ensuring these layers remained intact, we preserved the biological scaffold of the nasal framework and the conditions for unimpaired nasal growth.

The degree of nasal distortion in this patient four years of progressive expansion to a size that altered nasal shape represents a less commonly described presentation in the published literature on nasal dermoid, where most reported cases involve smaller lesions detected earlier in childhood. The distortion had arisen because the cyst had expanded the soft tissue envelope of the nasal dorsum from within, stretching the overlying skin and broadening the dorsal profile. Following cyst removal, the stretched skin redraped spontaneously over the nasal skeleton, which had remained undisturbed beneath. This spontaneous re-draping is a consequence of the inherent elasticity of paediatric skin and the intact underlying scaffold, and it spared the need for any additional reconstructive manoeuvre to restore nasal contour. This case also reinforces the importance of preoperative MRI in all nasal dermoid cysts regardless of clinical appearance. Intracranial extension, reported in up to 25% of cases in some series, is not reliably predicted by clinical examination alone^[6].

MRI provides definitive characterisation of the lesion extent, identifies any deep tract toward the foramen cecum, and determines whether neurosurgical involvement is required. Only with intracranial extension excluded can a plastic surgeon safely plan and execute excision through a peripheral nasal approach without risking inadvertent entry into the intracranial compartment^[7].

Finally, timing of surgery deserves mention. The four-year delay in this case, while understandable in a resource-limited context, resulted in a level of nasal distortion that would not have occurred with earlier intervention. Nasal dermoid cysts do not resolve spontaneously, and their growth, though slow, is relentless. Early surgical referral and timely excision ideally before the lesion has distorted the nasal framework reduces the complexity of surgery and the degree of cosmetic deformity the child must endure during the critical years of social development.

Figure 5: Post Operative Image with sutures [original]



CONCLUSION

Nasal dermoid cysts causing progressive nasal distortion in children require surgical intervention with the dual objectives of complete capsule removal and preservation of nasal architecture. A vertical incision placed over the lateral nasal wall provides adequate exposure for capsulectomy while avoiding a conspicuous midline dorsal scar. Intraoperative cyst rupture, when managed with prompt irrigation and systematic capsulectomy, does not compromise the oncological adequacy of excision provided no capsular epithelium is left behind. Preservation of the underlying periosteum and perichondrium ensures unimpaired nasal growth and spontaneous re-draping of the nasal soft tissue envelope following cyst removal. Early surgical referral is recommended to prevent progressive nasal distortion and minimise reconstructive complexity.

DECLARATIONS

Patient Consent: Written informed consent was obtained from the patient's parents/guardian for publication of this case report and accompanying clinical images.

Ethical Approval: Institutional ethical clearance was obtained in accordance with institutional policy for publication of anonymised paediatric case reports.

Conflict of Interest: The authors declare no conflict of interest.

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