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# A Study on the Presentation and Management of Nasal Dermal Sinus

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**Abstract** **Original Research Article**

***Aim:*** Nasal dermal sinus is a relatively rare congenital condition. We have reviewed our experience in the presentation and managements of these cases. ***Patients and Methods:*** This is a retrospective study from June 2006 to January 2019. Patients presented with a nasal pit, with or without a hair in it were selected. They were studied for their various aspects before and after operation. ***Results:*** Out of **e**ight patients studied one presented with infection and hence operation was done at a later date. One patient's parents refused operation and hence seven patients were operated. Complete excision of dermal sinus by midline vertical incision under general anaesthesia was done. One patient had recurrence and was re-operated 14 years later. Follow-up was from 1 to 13years, with mean of 6 years. ***Conclusion:*** **N**asal dermal sinus and dermal cyst without fistulae are two different entities. Most of these sinuses do not bear the intracranial extension. Excision can be done from the face and cranial exploration is rarely required.

**Keywords:** Nasal dermal sinus, Sinus with hair, congenital nasal pit, Nasal pilonidal sinus.



## INTRODUCTION

Nasal dermal sinus in children is relatively a rare disease. It is characterized by a small pit since birth in the midline either from the root of the nose through the nasal bridge to the base of the columella. The opening may have a coarse hair coming out from it and occasionally it discharges white sebum like material. Its incidence is 1:20 000 to 1:40 000 births [1]. Its Pathogenesis has been explained in various ways. Superficial sequestration or incomplete obliteration of neuroectoderm in the development process in the frontonasal region is two most accepted theories [2]. Nasal dermal sinus and cyst are often considered as a same spectrum of disease. Apart from clinical examination CT or MRI scan is required to find out size and extension, particularly for intracranial component, if any [3]. The condition requires early surgical management. Delay in management can cause infection, fistula formation and scarring. These complications cause disfigurement and complete excision of the sinus becomes extremely difficult. If there is any intracranial extension of the tract, infection of this may cause meningitis or brain abscess [4].

The cases of nasal dermal sinus encountered by us have been analyzed here.

## MATERIAL AND METHODS

This is a retrospective cohort study done in the Paediatric Surgery Department of a tertiary medical Centre. Eight patients with nasal dermal sinus were included in the study. Period was fourteen years from June, 2005 to May, 2019. Though dermal cyst and sinus terms were used confusingly by some authors, pure dermal cyst of this region was not encountered in this study. Few cases of mass in the nose and fronto-nasal region without sinus were encountered. All of them showed as different entity in clinical examination and in investigations and hence excluded from the study. Along with the other histories, family history of similar sinus was specially enquired.

Antero-posterior and lateral X-ray was done in some early cases and since 2008 CT or MRI scans were done to assess the patients with this condition.

Two patients had associated anorectal malformation with this condition. In one patient excision of punctum was done along with the pull-through operation. One of these patients offered operation of dermal sinus along with anorectal malformation operation. Investigations were done. But parents wanted to postpone the operation for nasal

dermal sinus till the operations of anorectal malformation are completed.

All the eight sitting of operations of seven patients were done under general anaesthesia.

Histo-pathological examinations of all the excised specimens were done.

## RESULTS AND OBSERVATIONS

During this fourteen year of study period we encountered eight cases of nasal dermal sinus. Out of these six patients were male and two were female.

Age of diagnosis was ranged from day 2 to 6 yrs and operation from 5 months to 14 years (Table 1).

**Table 1: Age distributions of the patients at presentation and operation**

| Cases | Case 1 | Case 2 | Case 3 | Case 4 | Case 5 | Case 6 | Case 7 | Case 8 |
|---|---|---|---|---|---|---|---|---|
| Age at presentation | Day 2 | 1yr | 6m | 2yr | 1½ m | 11m | 6ys | 6 m |
| Age at operation | 5m & 14 years | 1yr | 9m | 2yr2m | 6m | 1yr | 6yr | Waiting |

In a female patient the diagnosis of this condition was made at neonatal period. She had ano-rectal malformation as well. Incomplete excision of the punctum region only was done at five months of age along with her anal transposition operation. She had recurrence and came for treatment at 14 years of age (Figure 1). Re-operation was done with complete excision of the tract.

Opening in the dorsum of the nose since birth were the main complaint (Figure 2). One patient (Case no 4) had opening in the mid part of nasal bridge. He also had slight widening of the nose, inflammatory swelling in the nasal bridge region with a pus discharging sinus on the right side of nasion, close to lacrimal sinus (Figure 3). The patient was treated with antibiotic and was operated 2 months later as the infection subsided (Figure 4). Another male patient (case number 8) it was an incidental finding. Parents were unaware of the consequence of the condition. This case was associated with anorectal malformation. Though the patient came to hospital in neonatal period, the condition was diagnosed only at six months of age while came for pull-through operation. Parents wanted to wait for operation of this condition till the treatment for ano-rectal malformation is over.

**Figure 1: Fourteen year old girl with recurrent congenital nasal dermal sinus**

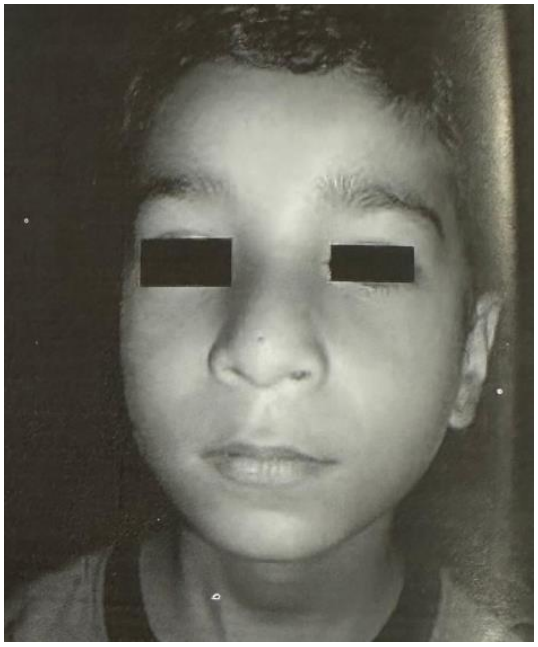

**Figure 2: Typical case of congenital nasal dermal sinus**

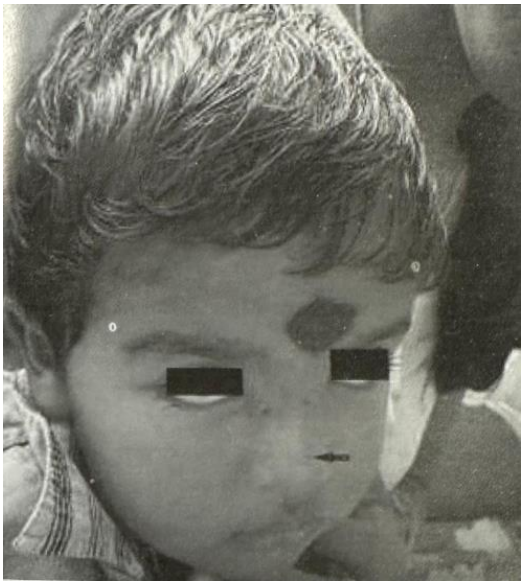

**Figure 3: Infected nasal dermal sinus. Punctum can be seen away from the site of infection (Arrow)**

**Figure 4: Post-operative photograph of the patient of Figure 3 after subsidence of infection**

In no patients family history of similar condition was present.

Various locations of the openings are as follows. Six cases had their external openings in the nasal bridge, mainly in the lower part. One each was in the base of columella and the tip of the nose (Table 2). Three patients with opening in the nasal bridge had single coarse hair coming out of the opening (37.5%).

**Table 2: Locations of external openings and with hair or not**

| **Cases** | **Case 1** | **Case 2** | **Case 3** | **Case 4** | **Case 5** | **Case 6** | **Case 7** | **Case 8** |
|---|---|---|---|---|---|---|---|---|
| External opening | Lower nasal bridge | Lower nasal bridge | Tip of nose | Mid nasal bridge | Base of columella | Junction of nasion & bridge | Lower nasal bridge | Junction of bridge and tip |
| Presence of hair/infection | Hair present | None | None | Infected | None | Hair present | Hair Present | None |

In two cases the disease was associated with anorectal malformations and one each was from the either sex.

Computed tomography (CT) scan [n=3 (37.5%)], magnetic resonance imaging (MRI) scan [n=2 (25%) plain X- ray [n=3 (37.5%) was done. Only X-rays were done in three cases and all these were before 2008.

No sinogram was done.

Changes in CT and MRI are identical. There was separation of nasal bones, bifid crista galli and wide foramen caecum. Tract of various lengths could be seen in MRI. No cases had defect of cribriform plate and evidence of intracranial mass.

No case of nasal dermal sinus encountered which had its intra-cranial extension.

All the Patients were operated under general anesthesia. A midline vertical incision was made. The punctum was removed in continuity with an encircling incision. The whole tract was dissected out. In all the cases nasal cartilage and nasal bone failed to fuse in the mid line making the dissection easier. Last part of the tract had a thin fibrous cord going towards the foramen caecum and was divided by sharp dissection. Only difficult case was the case no 4, where adhesion to skin and deeper structure encountered due to scarring.

No cases required any filling or plastic reconstruction procedure.

Post-operative management was as usual. Wound kept open from the day 2 of the operation.

Histopathological examinations of all the excised tissues were done. In light microscopy the lining of the sinus was squamous epithelium. Other ectodermal elements like hair follicle, sebaceous glands,

and sweat glands were also noted. In the cases of sinus with hair, the hair originated from a hair follicle lying inside the sinus. No endodermal derivative was noted.

Systemic antibiotic was given to all the cases.

Stitch removal was done in 5$^{th}$ day of operation in most of the cases. In case no 4 it was on day 7. Mean hospital stay was 6 days.

Except in case no 4 where there was previous infection, scars were nominal.

There was one recurrence (Case no 1) where excision was incomplete. It was reoperated at 14 years of her age. This case was followed up for six months and there is no recurrence till date. In other cases follow-up was for 1year to 13 year and mean follow up was six years. There was no recurrence in these cases.

## DISCUSSION

Nomenclature and classification of this condition is confusing [3]. Many authors have used the term dermal sinus and dermal or dermoid cyst of the nose equivocally [3]. In some publications many unrelated conditions of this region have also been included.

In some studies midline nasal mass was the main presenting feature. This was because of the fact mentioned above. As we included only sinus cases, it was the main presenting feature in our series. Hair protruding from the punctum was also a prominent feature. Because of this some authors have named dermal sinus of the nose with a hair as pilonidal sinus [5-7].

Various associated anomalies like ear and craniofacial anomalies were observed in other series [8]. Our series had 2 cases (25%) with anorectal malformation. But no literature with this association was found.

Bifid crista galli and enlarged foramen caecum in CT and MRI scan is a common sign and it does not indicate any intracranial extension of the sinus. But absence of these definitely indicates the absence [9]. In our series we found the above bony changes in all the patients but none had defect in cribriform plate. We did not encounter any case with intracranial extension. A narrow fibrous band may be found in the continuity of the tract. It may go beyond the nasal bone up to nasofrontal suture. Instead of doing extensive dissection this can be safely divided across at the level of termination of the tubular structure [10].

Squamous epithelium, sebaceous gland and dermal elements like hair in HPE indicate that this type of sinus develops from ectoderm by sequestration in fourth to sixth weeks of intra uterine life as forwarded by Bland-Sutton (1893). Presence of hair follicle differentiates it from epidermoid cyst (Sebacious cyst), While absence of endodermal element excludes its teratomous origin [11].

Midline vertical incision was employed by many authors. We also employed the same. Other incisions like transverse, inverted-U, and transnasal approach are advocated by many authors [9, 11, 12]. The incisions other than midline vertical type were used for nasal cyst excision and wherever rhinoplasty was required. We did not encounter any difficulty in excising the tracts from nasal approach. Only case no 4 had an inverted L shaped scar as we excised the scar of previous sinus in continuity.

Recurrence rates in other series were 30% to100% [13]. Mostly it was due to incomplete excision and previous infection. In our series one case out of seven patient operated had recurrence. There was no recurrence in this case after the second operation. The only case with previous infection had no recurrence.

## CONCLUSION

The present series is a small one. It is because the disease is rare and without any ambiguity only midline nasal sinuses are included here. Hence, in our opinion paper bears some special characteristics.

In our view nasal dermal sinus and dermal cyst without fistulae are two different entities.

Most of these sinuses are limited to nose outside the foramen caecum and intracranial extension is rare.

Majority of the cases can be managed by excision through the skin of nasal region. Cranial exploration is very rarely required.

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