Our experience in the treatment of complicated dermoid nasal cysts in children

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Objective: to generalize information on modern methods of diagnosis and treatment of dermoid nasal cysts in children based on the experience of our clinic.
Main contributions: A dermoid cyst is a benign neoplasm that occurs as a result of dipping of the ectodermal germ layer into the subjacent tissues in the fetal life or on congenital abnormality of three germ layers. Dermoid cysts are often located in places where sulci and grooves were located in the fetal life. They are also located in places where the deepening of the ectoderm is closed or the dermic buds are untied. Most often, dermoids are found in the face, neck, hindhead, interpleural space, resurrection bone, ovaries, presternum and mouth bed. A dermoid cyst may not show itself in any way. It is characterized by a benign course and slow growth. The article presents a clinical case of a complicated dermoid nasal cyst and the results of surgical treatment.
Conclusion: A dermoid cyst of the nose may not show itself clinically for a long time. Timely diagnosis and surgical treatment for children with this problem is the prevention of intracranial accidents. Therefore, this pathology should be given more careful attention. The main method of treatment is only surgical.
Key words: nasal dermoid cyst, dermoid, childhood, etiopathogenesis.

Introduction

Dermoid cyst of dorslim of nose is benign neoplasm that occurs as a result of developmental disability of the germinal epithelium in the fetal life. The name of cyst already supposed histologic cell count of the ectoderm. These cells appear inside the mesoderm and ectoderm tissues in the process of embryogenesis abnormality. Dermoid cysts are mainly localized in the midface and in the maxillary bone area in the projection of the primary clefts between the nasal and oral cavities. [1,2]

The first description of the dermoid was made by M.S. Veratus in 1745., when a brain tumor containing masses of hair and squamate remains were identified. [3,4,5]

Dermoid cysts must be differentiated from such neoplasms as epidermoids, melanoameloblastoma, botryoid rhabdomyosarcoma, atheroma, fibroma, hygroma, adipoma. [6]

The purpose of our contribution is to generalize data on modern methods of diagnosis and treatment of dermoid nasal cysts in children based on the experience of our clinic.

Patients and methods:

33 patients (16 girls and 17 boys) aged from 10 months to 14 years with genetous dermoid nasal arch cyst were examined and treated at the Federal State Budgetary Institution «The National Medical Research Center for Otorhinolaryngology of the Federal Medico-Biological Agency of Russia» during the 5-year period from 2016 to 2023. 15 people had a sinus opening at the tip or the dorslim of nose at the edge of the osteocartilaginous segment. 13 had a dermoid cyst of the dorslim of the nose without a sinus opening, of which 5 had intracranial communication, 5 patients had an epidermal cyst.

The examination included the gathering of complaints, an otorhinolaryngological checkup. All patients were settled computed tomography of the nose and paranasal sinuses with a section thickness of 0.5 mm. Magnetic resonance imaging of the brain with contrast-enhanced was made in cases of suspected intracranial communication of the dermoid cyst.

Discussion

The surgical treatment – removal of dermoid cyst of the dorslim of nose was made to all patients.

Surgical treatment is done under endotracheal anesthesia. A catheter -conductor colored with a 1% solution of brilliant green was injected into a sinus opening for determination the tract of the fistula. An elliptical incision was made around the sinus opening to fix the conductor and the fistulous tract itself. The incision continued vertically along the middle line along the path of the "conductor" (Fig. 1a). The next stage was to separate the fistula tract throughout its entire length until the neoplasm itself without damaging its walls (Fig. 1b). The incision along the mucobuccal fold was settled in the second stage in the area of the columella and the fundus of the nasal vestibule on the left. After that, the mucoperichondrium layers and mucoperiost are separated with a raspatory. This provides a better visualization of the area of nasal heterotopia. After separation from all sides of the fistulous passage to the cyst bed (which is most often located between the nasal bones, divorced due to its growth), it was completely removed. A control examination was made to identify cyst remains and prevent relapse under the control of endoscopes (00 and 300). Thus, the removal of the tumor was done by combined approach: external and endonasal (Fig. 1c).

The third stage was the reconstruction of the dorslim of nose by bringing the nasal bones closer together using Vicryl 4.0 stitch material. Layered suturing of the wound was done with the installation of drain tube in the area of the postoperative atrium after fixing the sutures and returning the shape of the external nose. This atrium appeared instead of the removed neoplasm and endonasal – through a previously prepared counterincision (incision of the mucoperichondrium at the edge of chondral and osteal parts of the nasal septum).

Tampons smoothed with antibacterial uncture or silicone splints were installed in the nasal atrium to fix the nasal septum after sealing the postoperative incision of the mucosa in the area of the nasal vestibule. Tampon removal was settled a day after surgery. The drain tube was also removed on the first day after surgery in the absence of exudate. And in the case of presence of exudate – on the second day after surgery. An aseptic dressing was inlayed to the postoperative wound in the area of nasal arch. The sutures on the dorslim of nose were removed on the 6th day after surgery.

The most difficult surgically are dermoid nasal cysts with intracranial communication and secondary affection in the form of osteomyelitis of the nasal bones with the switch to the ethmoid sinuses and apobiosis of the anterior wall of the frontal sinus.

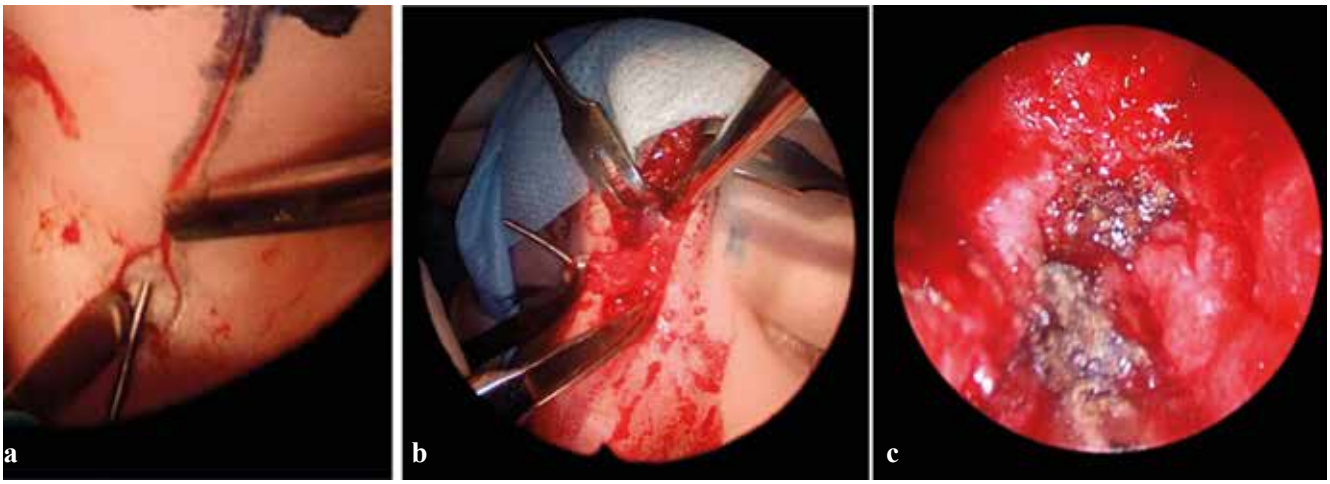


Fig.1. Stages of surgical treatment of congenital dermoid cyst with intracranial spread:

a – elliptical incision of the skin and subcutaneous tissue along the midline
b – separation of the fistulous tract along
c – control examination of the nasal cavity using endoscopic techniques.

As an illustration, we present our clinical observation.

Patient T., 2 years old, was in inpatient treatment in the pediatric otorhinolaryngological department from 15.02.2023 to 22.02.2023.

Clinical diagnosis: genetous dermoid cyst of the dorslim of nose with fistulous tract, intracranial generalization and osteomyelitis of the anterior wall of the frontal sinus.

Entrance complaint: bullation in the forehead, periodic discharge of puromucous or caseous-like fluid from the passage on the nasal arch, frequent inflammation with abscess formation in the forehead. According to the mother, from birth they began to mark a passage in the dorslim of the child`s nose, from which the caseous discharge was periodically separated and the mother removed single hairs at times. A rounded mass appeared in the forehead area, which began to increase with age in December 2020 (Fig. 2 a,b) The parents applied to the clinic in their home area and were examined by a surgeon oncologist in 19.01.2021. CT of the nose and accessory sinuses of the nose was made for the first time in 20.02.2021.

Fig. 2. Patient's appearance





a. during exacerbation



Fig. 2 b. before surgery



Fig. 2.c. before discharge from the hospital



Fig. 2.d. 1.5 months after surgery

Conclusion: a picture of additional space-occupying process of the basal area of the frontal cortex (frontoethmoidal meningocele cannot be excluded). (Fig.3) An MRI of the brain was made. Conclusion: there is no data for nidal and diffuse changes, extensive lesion of the cerebral hemispheres, scapus and little brain. MR- sighs of additional formation of external soft tissues of the frontal region with signs of spreading into the cavity of skull (Fig.4)

Fig. 3. CT data of the paranasal sinuses before surgery



Fig. 3a. CT images in 3D mode

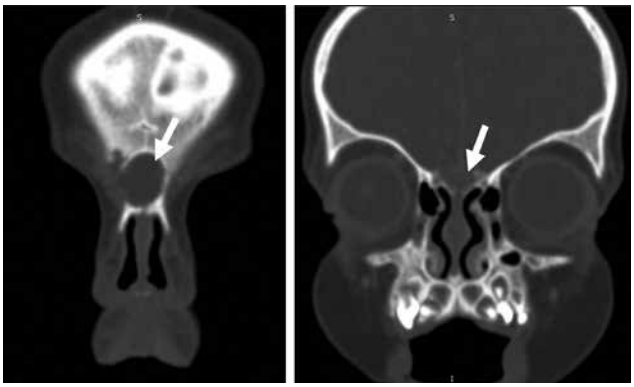


Fig. 3 b. in the coronary projection (the formation is indicated by an arrow).

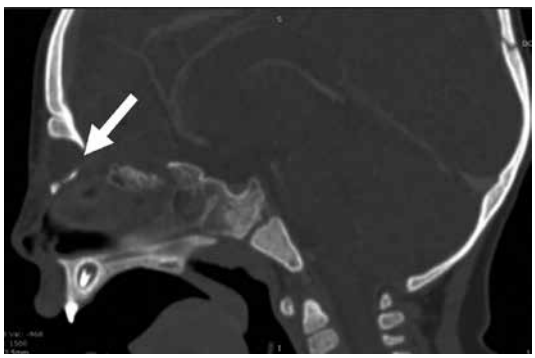


Fig. 3c. in the sagittal projection (the formation is indicated by an arrow).

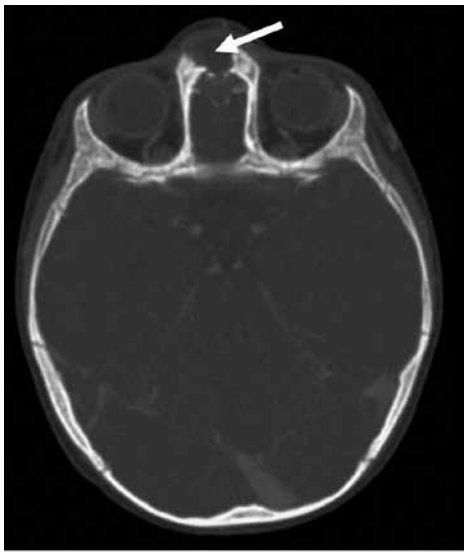


Fig. 3 d. in the axial projection (the formation is indicated by an arrow).



Fig. 4. MRI data of the brain before surgery in the coronal projection (the formation is indicated by an arrow).

He was at the hospital treatment in the septic surgery department in his home area from January 19 to February 1, 2021 with a diagnosis of apostasies of the frontal region of head, genetous fistulous tract of external nose. He was consulted in the home area by an oncologist: dermoid tumor of forehand with maturation and fistulous tract. Also, he was consulted by a neurosurgeon: data about a traumatic brain injury are absent. They were advised at the ENT-specialist with complaints of bulla-

tion and discharge of caseous masses with hairs from the passage on the nasal arch in April,2022. He was visited the FSBI «The National Medical Research Center for Otorhinolaryngology of the Federal Medico-Biological Agency of Russia» in May, 2022. The diagnosis was confirmed: genetous dermoid cyst of the dorslim of nose with fistulous tract, intracranial generalization and osteomyelitis of the anterior wall of the frontal sinus. The child is recommended to be hospitalized in the in the FSBI NMITs Otorhinolaryngology FMBA of Russia, Moscow for further surgical treatment (removal of the formation of nasal arch).

Excision of fistulous tract and removal of dermoid nasal cyst followed by revision of the frontal sinus were made under endotracheal anesthesia with combined access under endoscopic endonasal control on 16.02.2023. The postoperative course is seamless. He was dismissed in satisfactory condition for further outpatient observation on 22.02.2022 (Fig. 2c, fig. 2d). The patient underwent a control CT of the paranasal sinuses within a year after the operation (Fig. 5)

Fig.5. CT data of the paranasal sinuses 1 year after surgical treatment.



Fig. 5a. CT images in 3D mode

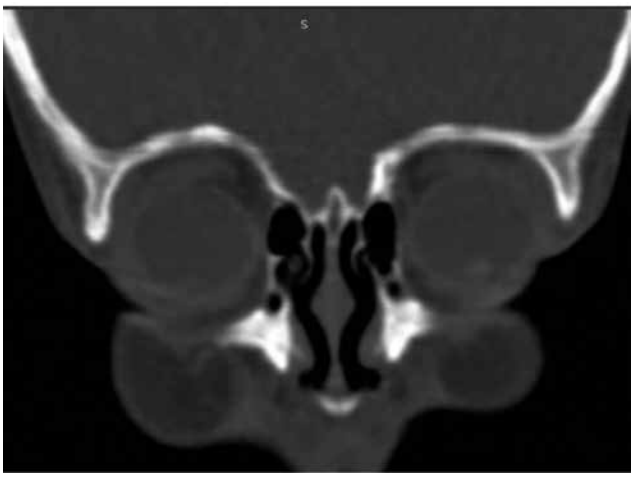


Fig. 5b. CT in the coronary projection



Fig. 5c. CT in the axial projection

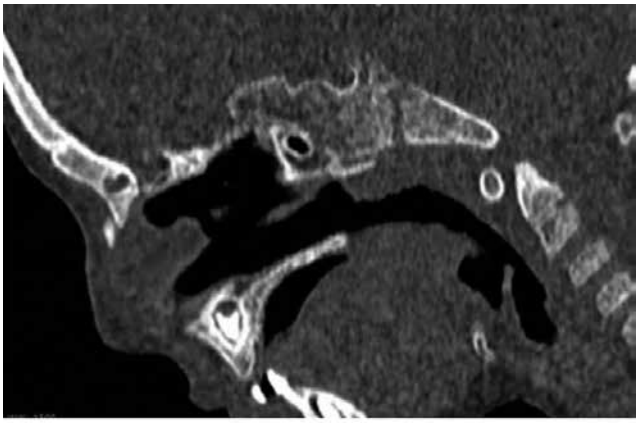


Fig. 5d. in the sagittal projection

Conclusion

Dermoid cysts, gliomas, craniocele have similar embryological development and can be accompanied by bone defects, intracranial generalization and various accidents (central osteitis of nasal bones, breaking of the osseous structures of external nose, brain fever ect.). It is necessary to settle CT of the nose, accessory sinuses of the nose and magnetic resonance imaging of the brain while examining such patients. The treatment of this pathology is only surgical. A consultation with a neurosurgeon is indicated before surgery in cases of intracranial generalization of the dermoid cyst. This is necessary to determine an adequate surgical approach and specify the need for multidisciplinary approach to solving this issue.

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