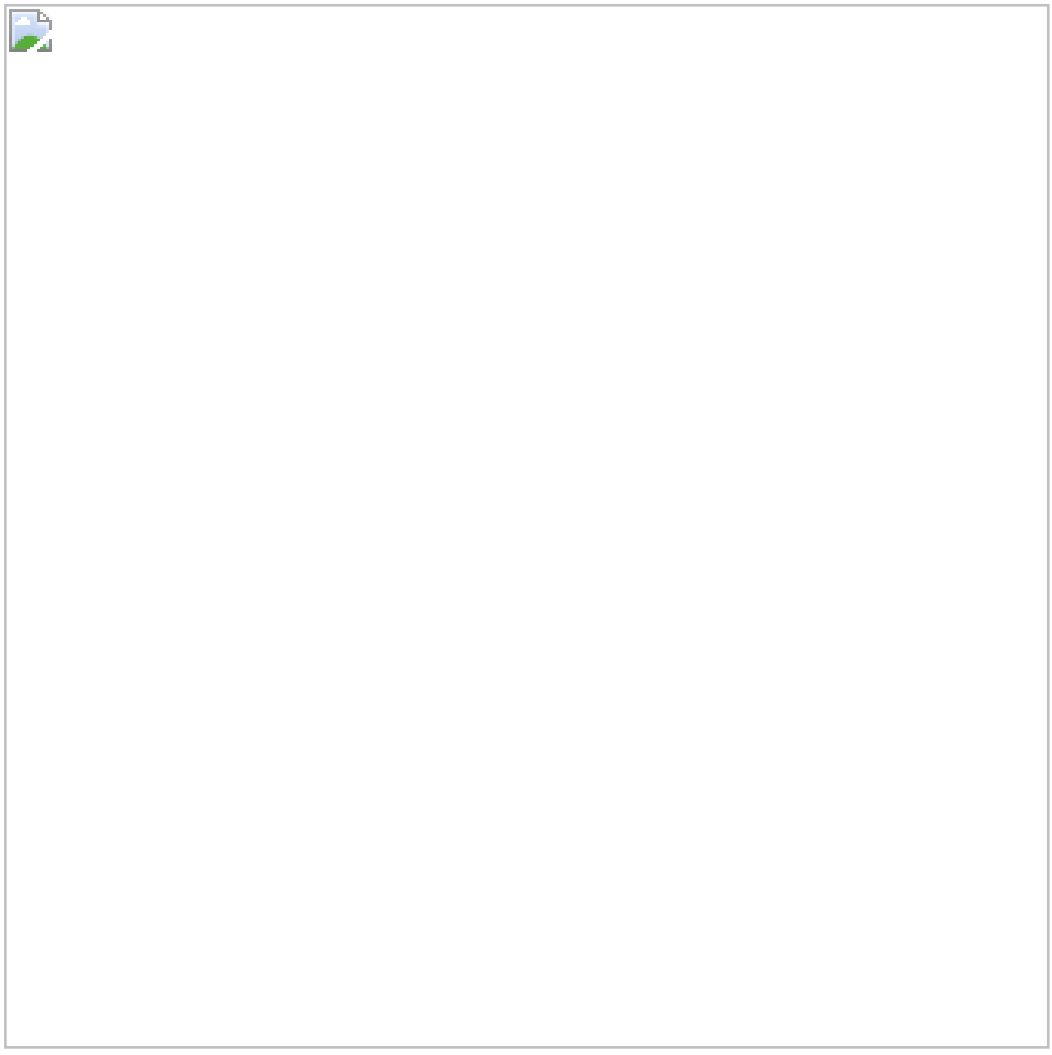

Excision of a nasal dermoid sinus cyst and primary reconstruction using an autologous fascia lata graft in a cat

Authors: Manzoni, Sara, Aloisi, Roberta, and Bongartz, Alexandre

Source: Journal of Feline Medicine and Surgery Open Reports, 10(2)

Published By: SAGE Publishing

URL: https://doi.org/10.1177/20551169241269284

Case Report

jfms OPEN REPORTS

Journal of Feline Medicine and Surgery Open Reports
1–6

DOI: 10.1177/20551169241269284
journals.sagepub.com/home/jfmsopenreports

This paper was handled and processed by the European Editorial Office (ISFM) for publication in *JFMS Open Reports*.

Sage

Excision of a nasal dermoid sinus cyst and primary reconstruction using an autologous fascia lata graft in a cat

Sara Manzoni, Roberta Aloisi and Alexandre Bongartz

Abstract

Case summary A 6-year-old female spayed domestic shorthair cat was presented with a 7-month history of a subcutaneous mass on the dorsal nasal surface. A CT examination revealed the presence of a nasal dermoid sinus cyst with a nasal bone defect. The cyst was excised and an autologous fascia lata graft was used for reconstruction. The dorsal nasal bone was reconstituted and no compromise of respiratory function was reported in the long-term outcome. No short-term complications were observed at the 2-week follow-up. No long-term complications or recurrence were observed at the 2- and 12-month follow-ups. Fascia lata grafting appears to be an effective method for repairing a nasal bone defect after surgical excision of a nasal dermoid sinus cyst in cats. It is inexpensive and the tissue is easily harvested and provides good functional and cosmetic results.

Relevance and novel information To the authors' knowledge, this is the first report that evaluates the effectiveness of repairing a nasal bone defect after dermoid sinus cyst excision in a cat using an autologous fascia lata graft.

Keywords: Nasal dermoid sinus cyst; fascia lata; autograft; surgery

Accepted: 19 June 2024

Introduction

Congenital nasal dermoid sinus cysts (NDSCs) are developmental abnormalities of the midline nasal region, characterised by an accumulation of keratin, hair and sebum within a cyst lined by keratinised stratified squamous epithelium and adnexal skin structures.[1–4] NDSCs arise from the anomalous persistence of the foramen cecum during embryological development, which results in outpouching of the meninges into the pre-nasal space.[1–3,5]

Surgical resection of NDSCs is essential to prevent recurrence, progressive growth and/or infection of the lesions.[6–8] The selection of an appropriate reconstruction technique after the dermoid sinus resection is also an important step of surgical treatment, in particular when dorsal nasal bone and cartilage have been damaged by the lesion and the resection procedure.[9] In human medicine, various graft materials can be used for the repair of dorsal nasal defects, including autologous septal or costal cartilage, tutoplast-processed fascia lata and bioabsorbable plates.[9–11] However, in the veterinary literature, no guidelines are available for surgical reconstruction techniques after NDCS excision. This case report describes the surgical technique, complications, and short- and long-term outcomes of the use of a fascia lata autograft for repairing a nasal bone defect after dermoid sinus cyst excision in a cat.

Case description

A 6-year-old neutered female domestic shorthair cat was referred to our veterinary clinics with a 7-month history of a recurrent subcutaneous mass with purulent discharge on the dorsal nasal surface. Relevant history

VetTeam, Groupe Vétérinaire, Liège, Belgium

Corresponding author:
Sara Manzoni DVM, VetTeam, Groupe Vétérinaire, 7 avenue du général de Gaulle, Liège 94700, Belgium
Email: sarr.manzoni@gmail.com

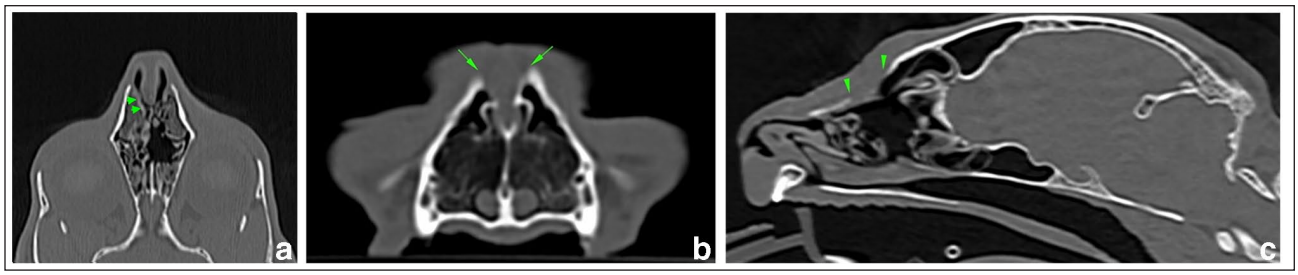

Figure 1 (a) Coronal plane CT image in bone reconstruction showing the presence of a ventrodorsal bifurcation of the nasal septum (green arrows). (b) Transverse plane CT image in bone reconstruction. The bony structures form a concavity 5 mm wide (green arrows), causing a dorsal opening from the nasal plane. (c) Sagittal plane CT image in bone reconstruction. Non-enhanced tissue attenuation material is present within the concavity, extending to the cutaneous surface of the frontonasal plane and mildly deforming it (green arrowheads)

included treatment with antibiotics, non-steroidal anti-inflammatory agents and corticosteroids, with relapse of the clinical signs occurring several weeks after the completion of treatment.

The cat's physical examination findings were normal, except for a 1 cm, round, non-painful mass between the eyes on the dorsal midline of the nasal bone. A 2 cm subcutaneous draining tract was palpated, extending from the focal round mass into a small opening visible on the nasal dorsum, and presenting mild discharge. The neurological examination was normal, and the complete blood cell count and serum chemistry findings were unremarkable.

A CT examination was performed for further evaluation of the lesions. Images of the head were obtained with a 64-slice CT scanner (Toshiba Aquilion; Canon Medical Systems) with a slice thickness of 500 µm and before and after injection of 2 ml/kg of iodinated contrast medium. The CT images revealed a ventrodorsal bifurcation of the nasal septum at the level of its middle dorsal third and a discontinuity of the nasal bone at its median plane (Figure 1a). The bony structures were connected and formed a concavity 5 mm wide, which extended from the most rostral part facing the incisor teeth to the height of the second maxillary premolar, thereby forming a secondary dorsal opening from the nasal plane (Figure 1b). Non-enhanced tissue attenuation material was present within the concavity and extended to the cutaneous surface of the frontonasal plane, thus resulting in mild deformation (Figure 1c). No intracranial extension of the lesion was observed on CT. The CT images were strongly suggestive of a congenital dermoid sinus cyst-type lesion with a secondary fistula and underlying infectious process.

The patient underwent complete removal of the NDSC by dorsal rhinotomy. Premedication with midazolam (0.2 mg/kg IV), ketamine (2 mg/kg IV) and methadone IV (0.2 mg/kg IV) was provided, and general anaesthesia was induced with propofol administered to effect intravenously and maintained with isoflurane in oxygen. Prophylactic ampicillin (20 mg/kg IV) was administered 30 mins preoperatively and every 90 mins thereafter. The patient also received a subcutaneous injection of meloxicam (0.1 mg/kg). Intraoperative analgesia was provided with fentanyl boluses (2 µg/kg IV) as needed.

The cat was positioned in sternal recumbency with the hindlimbs pulled forward into a frog-like position to facilitate fascia lata graft harvesting.

Fascia lata harvesting

After a cutaneous incision over the lateral aspect of the right thigh, subcutaneous tissue was bluntly dissected to expose the fascia lata. The fascia lata (Figure 2a) was excised using the following margins: proximally, the tensor fascia lata muscle; cranially, the sartorius muscle; caudally, the cranial border of the biceps femoris muscle; and distally, the level of the distal third of the femur. The fascial defect, subcutaneous tissue and skin were routinely closed.

Excision of the dermoid sinus cyst and application of the fascia lata autograft

An elliptical skin incision was made from the frontonasal junction to slightly caudal to the nasal planum. The frontalis, frontoscutularis and levator nasolabialis muscles were incised and retracted. The NDSC was dissected from the frontal and nasal bones (Figure 2b). En bloc excision of the split nasal septum from the frontal sinus until its rostral cartilaginous portion was achieved, resulting in a substantial dorsal nasal bone defect of 1.7 cm in length and 0.5 cm in width (Figure 2c). The bone defect was reconstructed with the fascia lata graft, which was sutured to the nasal and frontal periosteum with simple interrupted USP 4-0 polydioxanone sutures (PDS*II; Ethicon) (Figure 2d). The dorsal skin incision was closed with a simple continuous USP 3-0 nylon suture (Ethilon; Ethicon). Moistened gauzes were placed in the nasal cavities at the end of the procedure to limit postoperative bleeding and were removed 12 h postoperatively.

Postoperative analgesia was provided with methadone (0.2 mg/kg IV) every 4 h for 24 h. Amoxicillin clavulanate (20 mg/kg PO) was administered twice a day

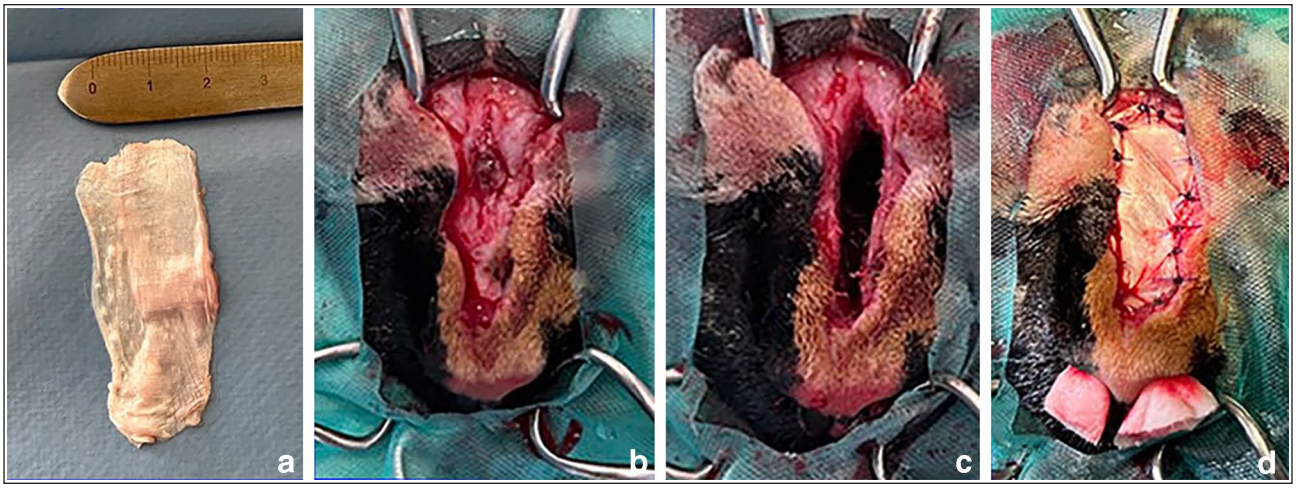

Figure 2 (a) Harvested fascia lata ready for transplantation. (b) A small elliptical skin incision was made over the lesions, from the frontonasal junction to slightly caudal to the nasal planum, and dissected from the upper lateral cartilage, dorsal septum and nasal bone. The nasal dermoid sinus cyst can be identified in the middle of the photograph. (c) Substantial nasal bone defect resulting from the en bloc excision of the lesions within the nasal cavities. (d) Reconstruction of the bone defect with the fascia lata graft sutured to the nasal and frontal periosteum with simple interrupted sutures. Moistened gauze was placed in the nasal cavities at the end of the procedure to limit bleeding in the 12 h after surgery

for 10 days, and meloxicam (0.05 mg/kg PO) was administered once daily for 5 days. The patient was discharged 3 days postoperatively. No intraoperative or postoperative complications were recorded. Histological analysis confirmed a diagnosis of dermoid sinus/cyst.

A wound check performed 15 days postoperatively showed complete skin healing. Mild bilateral serohaemorrhagic nasal discharge 48 h postoperatively was reported by the owner and resolved spontaneously. No lameness at the donor site was detected and the quality of breathing was good.

At the 2-month follow-up, the surgical wound was completely healed and the cat showed good cosmetic results (Figure 3). A CT scan of the head was performed and revealed the persistence of a small midline fusion bone defect in the rostral part of the frontal bone with no evidence of recurrence of a dermoid sinus. A partial rarefaction of the nasal turbinate, particularly on the right side, was also observed (Figure 4).

A complete midline fusion of the bone defect at the level of the aboral part of the nasal bone and the rostral part of the frontal bone was noticed at 12 months postoperatively CT (Figure 5a), even though a partial rarefaction of the nasal turbinate was still observable (Figure 5b). The postoperative CT imaging confirmed the absence of dermoid sinus recurrence; the patient still had a normal physical examination with satisfactory facial cosmesis (Figure 5c) and effective respiratory function.

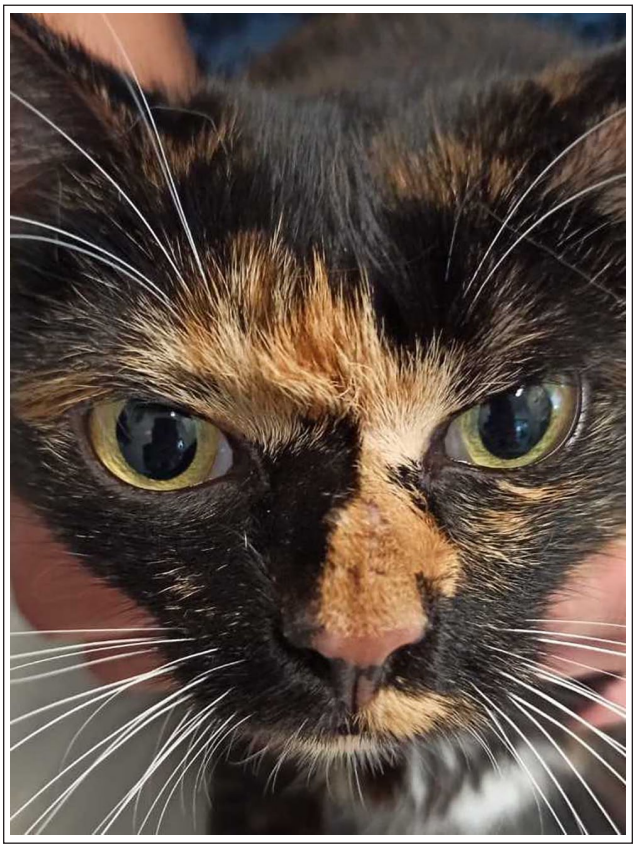

Figure 3 Photograph of the patient at the 2-month follow-up showing a good cosmetic result

Discussion

In the veterinary literature, NDSCs are a rare, infrequently reported congenital malformation. The differential diagnosis for NDCS includes inflammatory or infectious lesions, facial trauma sequelae or neoplasms,[6] which can be ruled out using CT or MRI. MRI appears to be particularly useful in human medicine to

Figure 4 (a) Transverse plane CT image in bone reconstruction showing the presence of a midline fusion defect of the nasal cavity at the level of the rostral part of the frontal bone (green arrow). (b) Coronal plane CT image in bone reconstruction. A partial rarefaction of the nasal turbinate is visible on the right side. (c) Sagittal plane CT image in bone reconstruction. The caudal part of the nasal cavities is within the normal limits and free of exudate

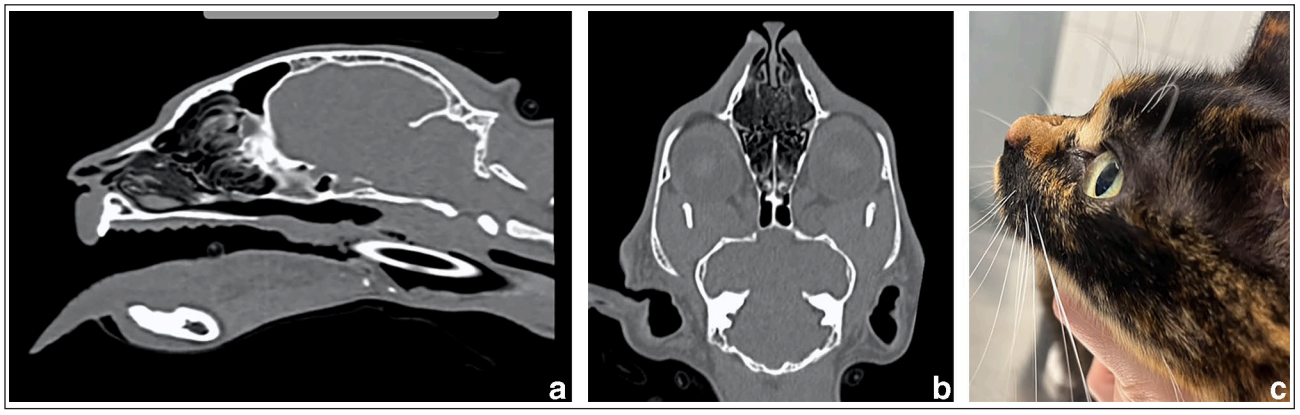

Figure 5 (a) Sagittal plane CT image in bone reconstruction. The aboral part of the nasal bone and the rostral part of the frontal bone are reconstituted and perfectly healed. (b) Coronal plane CT image in bone reconstruction. A partial rarefaction of the nasal turbinate is still visible. (c) Photograph of the patient at the 12-month follow-up with an excellent aesthetic outcome and no evidence of recurrence

differentiate NDSCs from other congenital masses, such as encephalocoeles, owing to its high soft tissue resolution.[6,12] Both CT and MRI have been suggested to be useful for diagnosis and surgical planning for NDSCs in previous human[3] and veterinary[13] reports. In our case, CT imaging was also appropriate to understand the extent of the lesion, particularly to rule out an intracranial invasion.

Surgery is the recommended treatment in human medicine to prevent recurrent infections and progressive growth of NDSCs.[14,15] Surgical outcomes are excellent, with complete removal of the cystic lining and its contents. However, when the excision is incomplete, a 100% recurrence rate has been reported.[16] Therefore, a wide surgical approach is required to visualise the extent of the lesions and to perform complete excision of the NDSC. Nasal bone reconstruction can be challenging, and grafting was considered a valuable alternative to primary closure after evaluating the pros and cons of both techniques. The pros of primary closure are the simplicity of the surgical technique, no morbidity related to graft collection and implantation, reduced surgical time and less suture material that could act as a nidus for infections. The cons of primary closure would have been the development of subcutaneous emphysema, the excessive tension on the suture line and the lack of periosteal support under the skin leading to an aesthetic defect of the nasal profile. For all these reasons, the use of a graft seemed to us the most appropriate option. When choosing the ideal graft material, it must meet some requirements: fulfil the objective function, not induce a foreign body response, integrate with the surrounding tissue, be resistant to infection, be easy to handle, be inexpensive and not degenerate over the long term.[17] In our case, we considered that autologous fascia lata would meet all the conditions described. The fascia lata has been reported, in multiple studies, to integrate with adjacent tissue without substantial tissue reaction and complications.[18,19] In fact, it has been successfully used for repairing perineal hernia,[18] diaphragm,[20] nasal bone fractures,[21] and

scleral,[22] hard palatal[23] and urethral[19,24] defects in dogs, with a 100% survival rate of the graft.

Because the defect was located on the frontal region, the relevance of using the fascia lata instead of the temporal fascia might be questionable; for the latter, the advantage is that it can be obtained from the same region, thus potentially decreasing the morbidity of the donor site. Temporal fascia has been successfully used as a graft in a previous report of the treatment of a fractured frontal sinus in a dog;[25] however, an experimental study has revealed that this graft has lower stability than a fascia lata graft during the early healing phase.[24] In our case, because of a wide bone defect and a lack of bone support, the fascia lata was considered more appropriate for the reconstruction.

Mild lameness of the donor limb has been reported several days after surgery[18] but was not observed in our case. In dogs, the application of allogenic canine fascia lata has been found to decrease surgical time and eliminate donor site morbidity;[26] however, no tests of biocompatibility have been performed in cats.

Complications associated with dorsal rhinotomy include entrance into the cranial vault and haemorrhage during and after surgery.[27] To prevent excessive and uncontrolled bleeding during the surgical procedure, a complete coagulation profile evaluation is recommended. In our case, a platelet count and a buccal mucosal bleeding time were performed and were normal, even though they provided an assessment only of primary haemostasis. Moreover, the use of intranasal gauzes significantly reduced the postoperative bleeding. The patient tolerated the use of the swabs well despite mouth breathing, but the risks/benefits of their use must be considered for each individual patient.

Conclusions

Fascia lata grafting appears to be an effective method for the repair of a dorsal nasal bone defect after dermoid cyst sinus excision in a cat. The fascia lata is easily harvestable with minimal donor site morbidity and allows rapid healing without complications.

Conflict of interest The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding The authors received no financial support for the research, authorship, and/or publication of this article.

Ethical approval The work described in this manuscript involved the use of non-experimental (owned or unowned) animals. Established internationally recognised high standards ('best practice') of veterinary clinical care for the individual patient were always followed and/or this work involved the use of cadavers. Ethical approval from a committee was therefore not specifically required for publication in *JFMS Open Reports*. Although not required, where ethical approval was still obtained, it is stated in the manuscript.

Informed consent Informed consent (verbal or written) was obtained from the owner or legal custodian of all animal(s) described in this work (experimental or non-experimental animals, including cadavers, tissues and samples) for all procedure(s) undertaken (prospective or retrospective studies). For any animals or people individually identifiable within this publication, informed consent (verbal or written) for their use in the publication was obtained from the people involved.

ORCID iD Sara Manzoni https://orcid.org/0000-0002-8902-1240

References

1 Anderson DA and White RAS. **Nasal dermoid sinus cysts in the dog.** *Vet Surg* 2002; 31: 303–308.
2 Sessions RB. **Nasal dermal sinus – new concepts and explanations.** *Laryngoscope* 1982; 92: 1–28.
3 Hartley BE, Eze N, Trozzi M, et al. **Nasal dermoids in children: a proposal for a new classification based on 103 cases at Great Ormond Street Hospital.** *Int J Pediatr Otorhinolaryngol* 2015; 79: 18–22.
4 White RAS. **Management of specific skin wounds.** *Vet Clin North Am Small Anim Pract* 2006; 36: 895–912.
5 van der Peijl GJ and Schaeffer IG. **Nasal dermoid cyst extending through the frontal bone with no sinus tract in a Dalmatian.** *J Small Anim Pract* 2011; 52: 117–120.
6 Pollock RA. **Surgical approaches to the nasal dermoid cyst.** *Ann Plast Surg* 1983; 10: 498–501.
7 Morrissey MS and Bailey CM. **External rhinoplasty approach for nasal dermoids in children.** *Ear Nose Throat J* 1991; 70: 445–449.
8 Cauchois R, Laccourreye O, Bremond D, et al. **Nasal dermoid sinus cyst.** *Ann Otol Rhinol Laryngol* 1994; 103: 615–618.
9 Kim JH, Wang HW and Jang YJ. **Excision of a nasal dermoid sinus cyst via open rhinoplasty approach and primary reconstruction using tutoplast-processed fascia lata.** *Clin Exp Otorhinolaryngol* 2010; 3: 48–51.
10 Jang YJ, Wang JH, Sinha V, et al. **Tutoplast-processed fascia lata for dorsal augmentation in rhinoplasty.** *Otolaryngol Head Neck Surg* 2007; 137: 88–92.
11 Mankarious LA and Smith RJ. **External rhinoplasty approach for extirpation and immediate reconstruction of congenital midline nasal dermoids.** *Ann Otol Rhinol Laryngol* 1998; 107: 786–789.
12 Barkovich AJ, Vandermack P, Edwards MSB, et al. **Congenital nasal masses: CT and MR imaging features in 16 cases.** *AJNR Am J Neuroradiol* 1991; 12: 105–116.
13 Brady S, Bell E, Courtman N, et al. **Nasal dermoid cyst with intracranial extension in a cat.** *JFMS Open Rep* 2019; 5. DOI: 10.1177/2055116919827404.
14 Bailey TR, Holmberg DL and Yager JA. **Nasal dermoid sinus in an American cocker spaniel.** *Can Vet J* 2001; 42: 213–215.
15 Moses MA, Green BC, Cugno S, et al. **The management of midline frontonasal dermoids: a review of 55 cases at a**

tertiary referral center and a protocol for treatment. *Plast Reconstr Surg* 2015; 135: 187–196.
16 Seidel DU and Sesterhenn AM. **Intracranial nasal dermoid sinus cyst: transnasal endoscopic resection by open rhinoplasty approach, with intraoperative video.** *J Craniofac Surg* 2016; 27: 2110–2112.
17 Hodde J. **Naturally occurring scaffolds for soft tissue repair and regeneration.** *Tissue Eng* 2002; 8: 295–308.
18 Bongartz A, Carofiglio F, Balligand M, et al. **Use of autogenous fascia lata graft for perineal herniorrhaphy in dogs.** *Vet Surg* 2005; 34: 405–413.
19 Atalan G, Cihan M, Sozmen M, et al. **Repair of urethral defects using fascia lata autografts in dogs.** *Vet Surg* 2005; 34: 514–518.
20 Suzuki K, Takahashi T, Itou Y, et al. **Reconstruction of diaphragm using autologous fascia lata: an experimental study in dogs.** *Ann Thorac Surg* 2002; 74: 209–212.
21 Ferreira AP, Oliveira AL, Mostachio GQ, et al. **Cranioplasty using autologous fasciae latae graft for nasal bone fracture repair in a dog.** *Acta Sci Vet* 2017; 45: 209.
22 Grundon RA, Hardman C, O'Reilly A, et al. **Repair of a scleral defect with an autogenous fascia lata graft in a dog.** *Vet Ophthalmol* 2011; 14: 271–274.
23 Castejón-González AC and Reiter AM. **Use of a barrier membrane to repair congenital hard palate defects and to close oronasal fistulae remaining after cleft palate repair: seven dogs (2019–2022).** *J Am Vet Med Assoc* 2024; 262: 1–10.
24 Lee DE, Kim KC, Jeong SW, et al. **Reconstruction of urethral defects using a fascia lata autograft in a dog.** *J Vet Med Sci* 2019; 81: 237–240.
25 Dunand L, Belluzzi E, Bongartz A, et al. **Application of a bilateral temporal fascia free graft in a dog with multifragmented frontal sinus and nasal bone fracture.** *Vet Surg* 2022; 51: 1002–1008.
26 El-Taliawi OG, Taguchi T, Dong F, et al. **Biocompatibility of allogenic canine fascia lata: in vitro evaluation and small case series.** *Vet Surg* 2020; 49: 310–320.
27 ter Haar G. **Dorsal rhinotomy**. In: Griffon D and Hamaide A (eds). Complications in small animal surgery. Ames, IA: Wiley Blackwell; 2016, pp 137–143.