RECONSTRUCTION OF NASAL BONE DEFECT DUE TO PARANASAL SINUS TUMOR WITH TITANIUM MESH IN A CAT

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Abstract

Feline paranasal tumors are rarely seen, approximately 1% of all feline tumors reported. Although they have a slow rate distant metastases, they are locally invasive to bone and cartilage. Titanium mesh has been used for many years for the purpose of nasal construction in human medicine and has less inflammatory reaction in the area applied than the other materials. In this case report, it is aimed to present the results of titanium mesh reconstruction for nasal bone in a cat.

A 7 years old, female, domestic short hair cat which was admitted to clinic with the complaint of sneezing, nasal dyspnea, epistaxis and a growing mass on the nasal area was subjected. In clinical examination, a mass on the nasal area was determined and in radiological examination nasal bone destruction was observed. The tumor ablation was achieved via dorsal approach and affected bone was also removed. The bone defect was reconctructed with titanium mesh. Povidone-iodine and nitrofurazone pomade impregnated gauze drain was placed into the nasal cavity before the titanium mesh placement. The biopsy specimen was taken during the operation and it was examined histopathologically, diagnosed as nasal sarcoma.

Patient's quality of life increased significantly until the 3rd month postoperatively, and the titanium mesh was stable on the control radiographs. Nasal dyspnea and slight swelling on the nasal area was reoccured at the 4th month postoperatively according to owners anamnesis by phone call, but the general situation was stable. Owner refused the further diagnostic work up.

Titanium mesh was found easy to apply and should be consider for reconstruction of nasal bone defects in cats.

Keywords*: Titanium mesh, Paranasal sinus tumor, Cat*

INTRODUCTION

Feline nasal and paranasal tumors are rare, approximately 1% of all feline tumors reported (Mukaratirwa et al. 2001). These tumors have a slow rate distant metastases, but they are locally invasive to bone and cartilage.

Mucopurulent or hemorrhagic nasal discharge, epistaxis, nasal dyspnea, sneezing, epiphora, facial deformity and exophthalmos are the general symptoms of the nasal tumors.

Diagnostic approach to paranasal tumors directed with history, physical and clinical examination, radiography, Computed Tomography (CT), magnetic resonans imaging (MRI), rhinoscopy, cytology and histopathology (Sullivan et al., 1987; Auler et al., 2015). Although the treatment of paranasal tumors may be challenging, the primary options are local disease control, surgery, chemotherapy, radiation therapy and immunotherapy (Hahn et al., 1992; Elliot et al., 2009; Adams et al., 1998; Forrest, 2009; Lana et al., 1997; Laing et al., 1988).

Although surgical approach to those tumors is not suggested by some authors, it still remains acceptable in some selected cases.

For the purpose of reconstruction of bone defects, titanium mesh has been used for many years in human medicine and has less inflammatory reaction in the area applied than the other materials. The objective of this study is to report surgical outcome of reconstruction of nasal bone defects due to paranasal sinus tumor with titanium mesh in a cat.

CLINICAL CASE

A 7 years old, female, domestic short hair cat which was admitted to clinic with the complaint of sneezing, nasal dyspnea, epistaxis and a growing mass on the nasal area was

subjected. In clinical examination, a mass on the nasal area was determined and in radiological examination nasal bone destruction was observed, also rostral part of the frontal bone was destructed (Fig. 1).

Figure 1.: Preoperative Skull Radiography L/L (white arrow destructed nasal bone)

Anesthesia was induced by propofol (5 mg/kg) and maintained with isoflurane&oxygen. Preemptive analgesia was achieved with morphine HCl (0,1 mg/kg sc). Cefazolin sodium (25 mg/kg iv) was administered as preoperative antibiotic. The tumor was reached via dorsal sinusotomy, after removel of the affected bone tissue and the tumor from the site, titanium mesh was placed to the bone defect and fixed with two cerclage wires to rostral and to caudal site of the defect . Povidone-iodine and nitrofurazone pomade impregnated gauze drain was placed into the nasal cavity before the titanium mesh placement. The patient started eating soft food after 24 hours. Amoxicillin-clavulanate (12.5 mg/kg BID for 7 days) was medicated for postoperative antibiotherapy. Meloxicam (0.1 mg / kg / 24h) was used as postoperative analgesic. At the 3th day, drain was removed. At the 10th day, the patient's sutures were removed.

The excised mass was evaluated histopathologically. The material weighs a total of 6 g and has dimensions ranging from 3 to 8 mm; it consisted of 11 masses with soft-elastic consistency. The sample was fixed in 10% neutral buffered formalin, trimmed, embedded in paraffin, sectioned at 4μm, and stained with Hematoxylin&Eosin for histopathological evaluation.

On microscopic examination, revealed pleomorphic and anaplasic cells with eosinophilic cytoplasm, oval and / or round, mostly hyperchromatic nuclei. In addition, necrosis and bleeding areas accompanied these cells (Fig.4.).

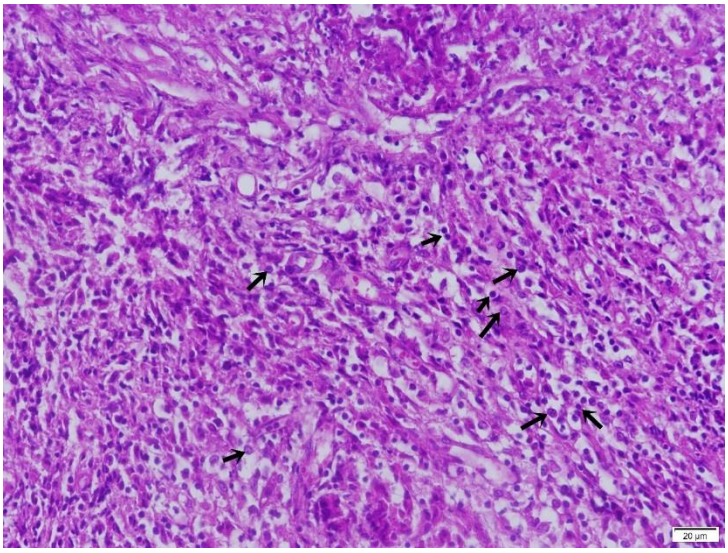

Figure 2: Tumor cells (arrows), X400, HE staining.

The mass was diagnosed as nasal sarcoma. Patient's quality of life increased significantly until the 3rd month postoperatively. Nasal dyspnea and slight swelling on the nasal area was reoccured at the 4th month postoperatively, the patient was admitted to clinic again. Although tumor recurrence is suspected, owner refused the further diagnostic work up and treatment options. The titanium mesh was stable on the postoperative 4th month radiographs (Fig. 3,4)

Figure 3: Postoperative 4th month Skull Radiography L/L

Figure 4: Postoperative 4th monthSkull Radiography V/D

CONCLUSION

Of the materials available for reconstruction of skull bone defects, titanium is more promising than others (Park et al. 2001). Despite its small number of deviations, radiolucency, corrosion resistance and less susceptibility to infection make it advantageous over others (Arens et al., 1996; Melcher et al. 1996). Although it is more expensive than polymethyl methacrylate (PMMA), it is easyto form and cost effective.Other reconstructive materials such as PMMA make the titanium mesh more preferable, because PMMA is more fragile and needed more surgical time for application and causes some inflammatory reaction in the surrounding soft tissues of the applicated area (Bordelon et al. 2007).

In previous studies (Can et al. 2016) Polymethyl methacrylate was used for the recontruction of the defected bone due to nasal neoplasia. In this case, titanium mesh was preferred for its advantages. Although the subjected area is small in this case, there was no difficulty in applying the mesh to defected nasal bone. Eventhough at the postoperative 4th month, there was a suspision of tumor reccurence, the titanium mesh was stable on the control radiographs.

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