

EQUINE SESSION

EQUINE SINUS SUTURE PERIOSTITIS: A REVIEW OF CASES FROM A MULTICENTER RETROSPECTIVE STUDY

J Easley, DVM, MS, DABVP/Equine, DAVDC/Equine

Verwilghen D, Uhlhorn M, Zwick T, Grulke S, Simhofer H, Vlaminck L, Bienert A

Sinus suture periostitis, suture exostosis, suture separation, or suturitis is an uncommon condition that should be included in the differential diagnosis of equine facial swelling. Horses affected with suture periostitis develop uni- or bilateral, firm, non-painful swelling in the frontal region of the head. The exact location of the swelling is dependent on the facial sutures affected. The problem is usually diagnosed from clinical signs and radiographs. Radiographs often reveal a radiolucent suture line surrounded by an area of increased opacity and callus formation. Due to the complex 3-D anatomy of the head and problems with superimposition of multiple bony structures, CT offers better imaging of the problem. CT usually shows irregular new periosteal reaction and proliferation with a cloudy appearance along involved suture lines. New bone formation is often bilateral symmetric and extends to the orbital region. (Furst and Auer 2019)

The condition is thought to be self-limiting and spontaneous resolves over time without treatment. Common complications are chronic epiphora if the lacrimo-maxillary suture is involved and chronic draining tracts if bone sequestra are present. In some cases, persistent instability can result in progressive increase in the size of swellings. In chronic complicated cases, surgical treatment with local debridement of bone sequestra fragments or even stabilization of the sinus sutures with bone plates has been used to resolve the problem. (Klein et al. 2014, Verwilghen 2014)

Several singular case reports of horses affected with the condition have been published, but no larger case reviews with follow-up are available. The aim of this ongoing multicenter retrospective study is to collect information regarding, breed, age, gender, housing, season of appearance, history of trauma or previous surgery, history of sinus pathology, location of swelling, imaging findings, initiated treatment, response to treatment and follow-up data on clinical cases of sinus suture periostitis.

As of March 2019, over 59 cases have been cataloged. The data on the cases have been analyzed and will be presented. No breed difference/predisposition, no age difference (but usually adult horses) and no regional, seasonal or housing differences were seen. The cases are grouped into one of four categories:

1. Swelling developed after sinus surgery (20 cases)
2. Swelling following trauma to the head (17 cases)
3. Swelling reported with underlying sinus pathology (8 cases)
4. Idiopathic swelling (14 cases)

Of the 17 trauma cases, 7 required surgery to remove bone sequestra and 7 persisted after 6 months to 1 year without treatment. Three were lost to follow-up.

The 8 cases following primary or secondary sinusitis had mixed follow-up results. Four cases had sinus cysts removed and responded favorably. Two had bone sequestra and required debridement without good follow-up. The other two had no secondary diagnosis or follow-up.

Twenty cases had a history of prior sinus surgery. Sixteen of these had a sinus flap (3 unknown method, 11 oscillating saw, and 2 chisel). Four were opened with a trephine (2 with a 6mm drill, 2 with a 24 mm trephine). Fourteen of these had sequestra/infection removed and they resolved. The other 6 had poor results at follow-up. Some surgeons reported a perceived increase in the number of cases with use of the oscillating bone saw for flaps.

The idiopathic suture swelling cases (no history of trauma, surgery or sinusitis) numbered 14. Imaging investigation did not show any involvement of sinus disease. Various remedies were tried, including no treatment, corticosteroids, NSAID's and topical anti-inflammatories. Of the 10 cases with follow-up information, 4 disappeared after 4 to 18 months and 6 persisted/slightly disappeared after 2 to 48 months.

Analysis of the cases revealed the condition can occur in 4 distinct categories: post trauma, post sinonasal surgery, in conjunction with a sinus disease, and without any reported reason. Any type of head trauma, leading to instability of the cranial sutures and/or any inflammatory reaction in the region has the potential to lead to the development of the condition. Pure traumatic insult to the head, leading to facial bone fractures and instability results in callus formation. Equally surgical insult created during sinusotomy by either bone flap or trephination can result in a similar situation.

Reviews on sinusitis, often mention the occurrence of suture exostosis in the enumeration of surgical complications (Greet 1992; Tremaine and Dixon 2001; Woodford and Lane 2006; Dixon et al. 2012) as can be confirmed in this case series. In the cases where surgical or traumatic insult is identified, it is expected that surgical stabilization of the suture line will overcome the instability and allow for faster and more complete healing of the suture/fracture site. Nonetheless, follow up of affected cases following sinusotomy is reported to show good resolution with a conservative approach (Tremaine and Dixon 2001) which is in contradiction to the current report where no surgical stabilization was performed and conservative management did not seem to resolve the clinical signs dramatically. The presence of sequestra and/or infection in the surgical region seems to be reported consistently in the surgical cases. Identification and removal of the sequestra and associated infection appears to bring resolution of the suture periostitis in these documented cases.

A number of cases were presented without any history or signs of either trauma or surgical sinusotomy. As previously stated by Dixon (1991), the apparently high incidence of the condition in Thoroughbred horses together with the bilateral symmetry of the swelling make the trauma theory in these cases less likely. The growth of the cheek teeth and their relation with the sinuses, the maxillary, and facial bones are a dynamic and evolutive process in the horse. Masticatory forces within this intertwined complex of teeth and bones play a role in the

development of facial structures (Hinton 1988). Compression forces occurring across the naso-frontal and inter-nasal suture during mastication may predispose to a bone reaction in the suture line (Rafferty and Herring 1999). Further, dental malocclusions may induce excessive forces on suture lines (Kasahara 2000). Horses presented with naso-frontal suture periostitis without history and findings of trauma should probably be controlled for presence of dental malocclusion and or dental eruption issues. Unfortunately no dental records of the described cases were available for review.

It is clear from the present case series that conservative management of these cases will rarely lead to full clinical resolution of the pathology. Spontaneous disappearance was reported in a number of cases within a 6-month timeframe (except one case where it took 1.5 years), initiating surgical treatment could be delayed in idiopathic cases until after this timeframe. This current case series also demonstrates the importance of the presence of bone sequestrates that may be involved in the occurrence of suture exostosis.

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