

Squamous cell carcinoma in equines mandible incisors

Introduction

Squamous cell carcinoma (SCC) is the most frequently described neoplasm in the horse. The most affected localization are the male and female genitalia, the third eyelid, cornea and the stomach are more often affected. Less involved are oesophagus, skin, hard palatine, arytenoid cartilage, maxillary sinus, peritoneal cavity, maxilla, lymph nodes and nasal cavity^{4,9,11,15,16,17}.

The tissue of the mouth, oral mucosa, hard palate, lips (with spreading into the hard palate), nasal cavity and paranasal sinus into the pharynx were listed as localization of the mouth. In case studies the most frequently affected localization of equine SCC was encountered the maxillary sinus⁷.

The SCC is a slowly progressive, destructed growing malignant neoplasm which is characterized by disruption of tissue and often followed by loss of teeth^{2,10}. Many times bad, necrotic odor is reported. The involvement of UV-light as a cause has been described in the cutaneous form of SCC (especially in Clydesdale horses) but not yet been proved^{12,20}.

Case

A 19 year old palomino welsh mare has been introduced for a routine ambulant dentistry. She has been treated every year and her case reports are available. A diastema (size 0,5 cm) in between 310 and 401 has been documented every year. Recently the owner of the horse observed an increase of the diastema.

Clinic

The general condition of the horse was fine. The occlusion of the incisors was zentral, the lateral excursion till contact of the molar tables was 5 mm to both sides. There was an obviously, but bad definable 1,5 cm large tumor between 301 and 401. The extension of the diastema shows a flat lingual enlargement and a labial swelling. The horse shows also sharp points and ATR of the cheek teeth. Dentistry has been performed and a sampling of the tumor was taken.

Differential diagnosis

All other neoplasia and chronic inflammatory diseases of the mouth should be differentially excluded.

Continuative examinations

Histological-pathological examination

Two samples have been taken in an interval of two weeks and two different laboratories investigated the tissue.

In the first examination two (0,7 g heavy, pumpkin seed seize) pieces of tissue covered with a white mucosa were examined. The extracted gingiva showed a homogeneously structure. The histological preparation showed an assertion of the collagenous matrix with a large quantities of small and wide strands of diffuse confined, relatively big cells with a large amount of anisonucleosis and polymorphy of the nucleus, plus obvious nucleoli, stored mitosis and in the center of the strands differently strong distinctive cornification. In the interstitium were multifaceted inflammatory cells. These transformations are evaluated as portions of a keratinizing squamous cell carcinoma of the oral mucosa³.

In the second examination were four samples (in between 7 x 6 x 2 mm to 11 x 7 x 4 mm) send. Stain: hematoxilyn eosin. It is oral mucosa. The histological examination gave a comparable result in every sample: there is a bulged mucosa which shows sectionally ulcerations. In the mucosa proliferate rounded cells a wide cytoplasm margin and a variable morphology. They form small islands and nests, in which they show irregular, squamous epithelial differentiations. The nucleuses are big and round, parts with several nucleoli and wide cytoplasm margin. They lay closely, infiltrate into the submucosa and are embedded into tight collagenous stroma. There exists a lymphoplasmacellular collateral reaction. The area of the ulcerative epithelia shows additionally a directed granulating reaction with neovasculation and fibrosis. For the examination were part extirpation send. A squamous cell carcinoma was diagnosed. The dignity was graded malign and the prognosis is rated as cautious. It is a slowly growing, local aggressive neoplasia; it is possible that metastases are developing in the local lymph nodes⁸.

It is a malignant tumor, starting from the epithelia tissue, can may recurrent and metastasizing.

Radiological examinations / Computed tomography examinations

The overview x-ray (0°, -45°) of the mandible incisors shows an extended gap between 301 and 401 decreased bone density. The computed tomography examination shows both a hypodense bone structure in the axial section and a drawn in of bone contour in the coronar section.

Therapeutic options

The different therapeutics options include among others the surgical extirpation, radiotherapy, intralesional chemotherapy with cisplatin and a local application of 5% fluorouracil cream.

Surgical extirpation

The surgical excision is the treatment of choice depending on size and position of the tumor. The surgery can be difficult and the probability of recurrence is high. An extensive excision of the carcinoma with 1 cm safety distance, like a possible hemimandibulectomy, would improve the state but would most likely lead to an unbearable, functional and cosmetic change¹²

Radiotherapy

Two procedures found in the literature reach good therapeutically results. On the one hand there has been the Y-radiation been described and on the other hand the interstitial iridium-192-brachytherapy with linear, platin coated wire.¹⁰

Cisplatin

Injection of intralesional cisplatin in oily emulsion has proven efficacious in treatment. The therapy starts with a two week interval (1mg cisplatin/cm³ into the tissue). In humans numerous side-effects including nephrotoxicity, severe nausea and vomiting, myelosuppression, ototoxicity and neurotoxicity are described².

5% fluorouracil

Three horses with a superficial ulcerative squamous cell carcinoma were successfully treated with topical 5-fluorouracil. The cream is usually applied daily for a month. Although the three cases reached excellent cosmetic results, they didn't produce a clinical cure. The cutaneous signs were largely eliminated¹⁵. The therapy with 5 % fluorouracil could be a useful supplement therapy when there a small cutaneous lesions on the lip or the cheek¹³.

Discussion

The mare which was introduced in this case showed for year's non-pathological diastema between 301 and 401. After 6 years, in an age of 19 years, the tissue in between the diastema started to increase. The mucosa was pink, shiny, and smooth and seemed normal. The further examinations were without any special characteristics. The horse showed normal condition. The routine dental work was done and a biopsy was taken. After two histologically examinations there diagnosis was beyond questions a squamous cell carcinoma. We published this case because of the diagnosis, the localization and the appearance of the tumor. A SCC shows malignant, epithelial changed tissue. More examinations were done to start with a possible therapy. In this case the tumor is growing slowly and stays in the localization of the incisors. The use of 5% Fluorouracilcream was not considered because this tumor is not cutaneous location. The results to cure a SCC were rather poor and the most horses were euthanized^{7,18,19}. The prognosis is bad, but metastases are growing slowly and horses are able to live even in an advanced decline¹². Radiotherapy was not being considered because of the fact that the therapy includes several repeating therapeutic treatments for weeks in a stable far away from home and the significant costs. The excision of the tumor was not being made because of the fact that the complete rostral part of the mandible has to be removed. In this case the extraction of incisors, alveolus and bone was intolerable. Right now the horse still lives in normal general conditions in a comfortable stable.

The x-ray and the CT-depiction are provided with the friendly permission of Dr. med. vet. Michael Nowak und Frau Petzoldt , Pferdeklinik Duisburg. The histological pictures are provided with friendly permission of Dr. Anja Floto und Dr. Ulf Dumke (IDEXX Vet Med Labor GmbH).