

Equine antral follicle containing cartilage and bone: ovarian teratoma

Folículo antral equino contendo pelo, cartilagem e osso: teratoma ovariano

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Abstract

A teratoma is a tumor characterized by a change in the size of the ovary and by presence of well differentiated tissues that are not usual to ovarian stroma. This entity is derived from totipotent cells and early ovarian germ cell differentiation into various tissues. This report aims to describe the morphologic and histologic features of a teratoma found within an antral follicle in the ovary of a mare after slaughter. The ovary was 8 cm in diameter and had a smooth, nodular surface. One antral follicle of 4 cm in diameter containing fluid and lumps of material, both yellow in color, and adhering to a skin, cartilage and bone fragment 1 cm in diameter was visually identified to be attached to the ovarian tissue. Healthy follicles smaller than 3 cm in diameter and hemorrhagic follicle were also observed. Histologic showed normal ovarian tissue containing antral follicles, hemorrhagic follicles and neoformation of multiple tissues. The presence of areas containing epidermis, dermis and skin appendages (sebaceous glands, sweat glands and hair follicles) surrounding cystic cavities filled with keratin, fragments of the cholesterol crystal, and macrophage-containing, waxy sebaceous material was also noted. This paper reports the presence of a teratoma within an equine antral follicle and suggests functionality of the ovary, even in the presence of the teratoma, due to the presence of active antral follicles and recent ovulation.

Keywords: Tumor. Ovarian. Mare.

Resumo

O teratoma é um tumor caracterizado por alterar o tamanho do ovário e pela presença de tecidos bem diferenciados não usuais no estroma ovariano. Deriva-se de células germinativas ovarianas primitivas totipotentes e exibe diferenciação celular em diversos tecidos. Este relato tem como objetivo descrever os aspectos morfológicos e histológicos de um teratoma encontrado dentro de um folículo antral de ovário de



égua proveniente de abatedouro. O ovário apresentava 8 cm de diâmetro, aspecto nodular e superfície lisa. Foi identificado visualmente um folículo antral de 4 cm de diâmetro, contendo material fluido com presença de grumos, ambos de coloração amarela, pelos aderidos a uma crosta, cartilagem e um fragmento ósseo de 1 cm de diâmetro aderido ao tecido ovariano. Também foram observados folículos saudáveis menores que 3 cm de diâmetro e um folículo hemorrágico. A análise histológica revelou tecido ovariano normal contendo folículos antrais, corpo hemorrágico e neoformação caracterizada por composição tecidual múltipla. Também foi notada a presença de áreas contendo epiderme, derme e anexos cutâneos (glândulas sebáceas, sudoríparas e folículos pilosos), circundando cavitações císticas repletas de queratina, fragmentos de pelos, cristais de colesterol, material sebáceo e macrófagos contendo ceroide. O relato descreve a presença de um teratoma no interior de um folículo antral equino e sugere a funcionalidade do ovário, mesmo com a presença do teratoma, devido à constatação de folículos antrais e ovulação recente.

Palavras-chave: Tumor. Ovário. Égua.

Introduction

Ovarian disorders in horses are commonly found during the reproductive examination. For example, the tumors in the ovaries are frequently reported, like teratoma and tumor of granulosa cells. (Hughes et al., 1980; Lefebvre et al., 2005). Ovarian tumors are related to changes in size, physiology and ovarian function and therefore have great importance in equine reproduction. Teratomas are characterized by a change in the size of the ovary (Mccue, 1998). Typically, their occurrence is unilateral and is associated with an absence of secretory changes in the contralateral ovary (Fiala et al., 2011).

Teratomas are derived from totipotent primitive ovarian germ cells, which can differentiate into various tissues derived from the three embryonic germ layers (ectoderm, endoderm and mesoderm) (Vicus et al., 2011). A teratoma can also be called an embryoma, tridermoma, dermoid cyst, teratoid tumor or teratoblastoma, although 'teratoma' is the more appropriate term for this type of tumor. According to their histological characteristics, teratomas can be classified as mature (benign) or immature (Tan and Scotting, 2013). Teratomas should be differentiated from other non-neoplastic malformations, such as tissue ectopia, complex malformations, monsters or imperfect Siamese twins (Willis, 1951).

This report aims to describe the morphologic and histologic features of a teratoma found within an antral follicle in the ovary of a mare.

Case report

During the reproductive season of riding horses in the southern hemisphere, latitude 23° S, equine ovaries were obtained from a local slaughterhouse and transported in their natural state at 20°C. As usual at the slaughterhouse, all animals were mixed breed and detailed information of each animal was not available. Among the ovaries obtained, we observed an ovary that stood out due to the size, color and consistency of the contents of its follicles. This ovary averaged 8 cm in diameter and macroscopically exhibited a smooth, nodular surface with follicles less than 3 cm in diameter. A hemorrhagic follicle and a follicle that was 4 cm in diameter and filled with fluid mixed with lumps of material, both yellowish, adhered to the ovarian tissue by a crust, in addition to a 1 cm long cartilage and bone fragment (Figure 1A, B and C).

The ovary was fixed in 10% formalin, submitted for histology and examined under a light microscope (Nikon®, Tokyo, Japan). Histologic showed normal ovarian tissue, including normal and hemorrhagic antral follicles and neoformation of multiple tissues. There were areas of skin containing epidermis, dermis and skin appendages (sebaceous glands, sweat glands and hair follicles) surrounding cystic cavities filled with keratin, fragments of the cholesterol crystal, and macrophage-containing, waxy sebaceous material, which are features of a teratoma. The dermis contained a multifocal lymphoplasmacytic inflammatory infiltrate. Other fragments of fibrous tissue with collagen neoformation were present in

certain myxoid areas, foci of hyaline cartilage and compact bone. All tissues were found within the

well-differentiated tumor, leaving no doubt as to its classification (Figure 2A and B).

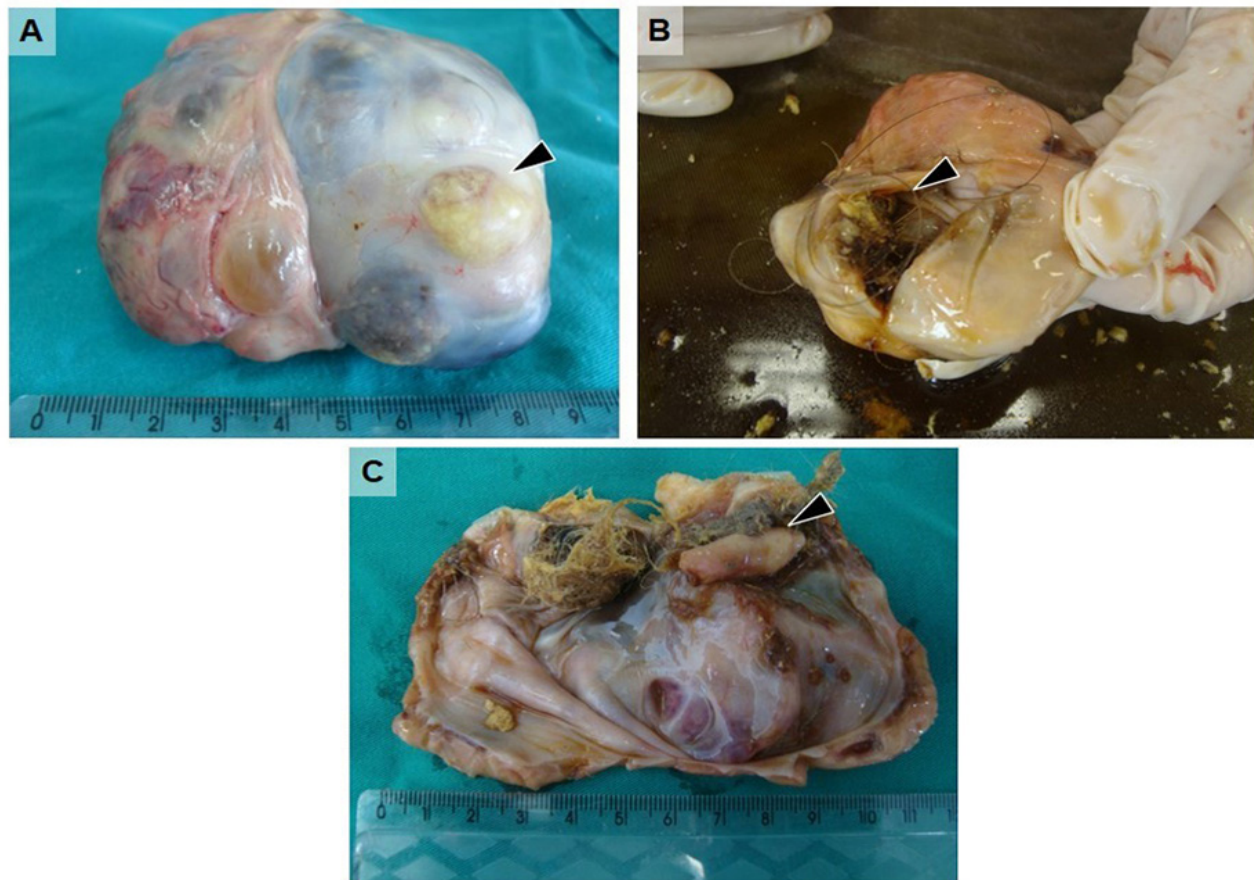


Figure 1 – An equine ovarian antral follicle containing a teratoma (arrow; A) and characterized by the presence of dense contents (arrow; B) and a follicle containing an exposed bone fragment (arrow; C)

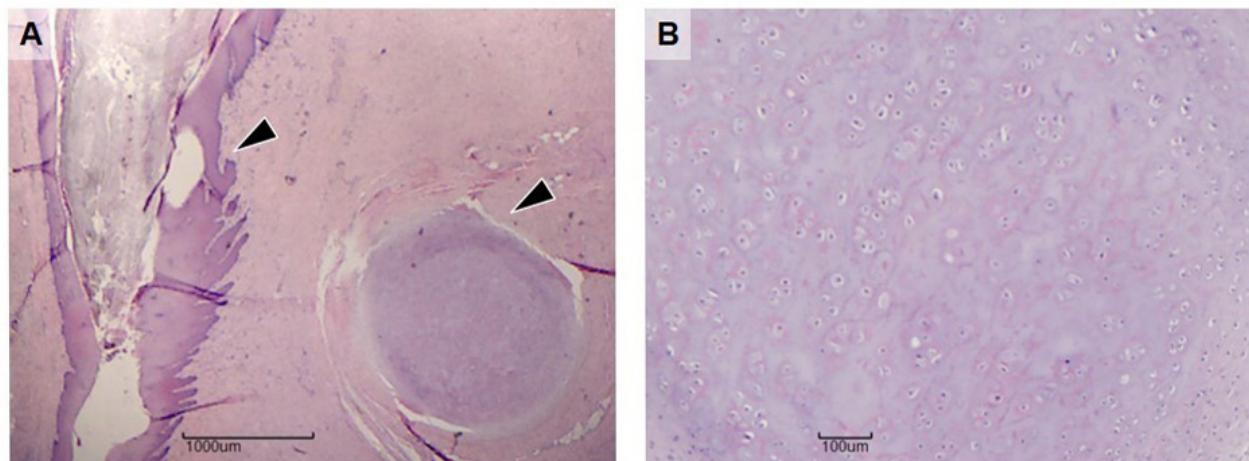


Figure 2 – Photomicrograph of an equine teratoma. Squamous epithelium surrounding an amorphous keratin mass and a cartilage nodule surrounded by connective tissue (arrow; A). Detail of well-differentiated cartilaginous tissue (arrow; B) Note: 400X, scale bar = 1000 µm (A), and 200X, scale bar = 100 µm (B). Hematoxylin and eosin.

Discussion

To the best of our knowledge, this is the first report of a teratoma inside an antral follicle in an equine ovary. Based on the findings of the histological examination, the ovary, obtained from a slaughterhouse, had an antral follicle that contained the teratoma. The ovary also presented healthy developing follicles and hemorrhagic follicles, suggesting functionality of the ovarian tissue near the follicle affected by the tumor.

There are disagreements about the classification of teratomas. The same structure can be classified as a dermoid cyst, consisting only of skin and no other tissues, such as nervous, glandular, respiratory, digestive, adipose, liver, or bone tissue or cartilage, although a teratoma has the possibility of combining these tissues (Schumacher, 2012). Therefore, a tumor is classified as a teratoma if it is reported to contain the following tissues: cartilage, bone and skin. Willis (1951) reported the cystic teratoma, characterized by the accumulation of secretions and one or more cavities with internal solid eminences of tissue. This description confirms the teratoma identified in this report, in which we observed the presence of bone and cartilage, accompanied by sebaceous secretion.

Teratoma found within the antral follicle possibly did not interfere in the cyclicity of the mare, as there were other antral follicles and hemorrhagic follicles in the ovary. The cyclicity is commonly reported in mares with ovarian teratoma, mainly because the activity of the contralateral ovary (McKinnon et al., 2011). However, in our case, it is interesting to highlight the possibility of some activity in the ovary which showed the teratoma, since it contained small antral follicles and an hemorrhagic follicle.

The teratoma observed within an antral follicle in an equine cystic ovary contained a wide variety of tissues, such as hair, bone and cartilage, accompanied by sebum secretion. This report describes this tumor as within an antral follicle in a horse and the concomitant presence of even healthy antral follicles and evidence of recent ovulation (hemorrhagic follicles). These findings suggest that despite the presence of a teratoma within the antral follicle, normal ovarian activity can be found, probably with minor impacts on mare's reproductive activity.

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