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Short Communication

Histology of two rice bodies isolated from the stifle of an adult draught horse stallion

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In the human and equine species, different kinds of free floating intra-articular particles are related to certain disorders. Osteochondral fragments formed during osteochondrosis dissecans are the most common finding in the equine species, whereas in humans rice bodies due to rheumatoid arthritis are more frequent. Herein we report a third type of floating body inside the stifle of an adult draught horse stallion, in macroscopic appearance similar to articular rice bodies known in humans. As revealed by histologic examination, the two particles consist of polypoid degenerated structures derived from synovial villi. Their formation was probably induced by ischemia.

Key words: joint, rice body, draught horse, synovium, histology

Generally spoken three different intra-articular nodules exist. Gálvez *et al.* [4] observed that in humans, most of the rice bodies developing in association with rheumatoid synovial fluid sediments were composed of partially or completely hyalinized fibrinous material with macrophages. The microscopic rice bodies sometimes expressed a central fibrosis. The authors believe that these intra-articular floating particles derived from cells entrapped within a fibrin network during synovitis. In some rice bodies neutrophils and to a lesser extent mononuclear cells were identified [4]. Mononuclear cells where predominant in other, although typically rheumatoid rice bodies. According to one research group, microinfarctions responsible for their formation are caused by rheumatoid diseases such as rheumatoid arthritis and infectious pathologies [1]. Rice bodies appeared in 34.9% of human rheumatoid arthritis, but were only found in 3.41% of osteoarthritis in humans where it consisted of synovial fragments covered by fibrin. We describe here the second type of intra-articular particles, not yet reported in the equine species. The third type, very common in horses, consists in osteochondral fragments, including partially necrotic bone material covered by cartilage [7]. The first two types are derived from the inflamed synovial membrane, the third from the articular surface.

The four-years-old draught horse stallion was regularly examined since two years of age in an interval of about four months at the European horse centre of Mont le Soie for lameness, and showed no orthopaedic problems, pain or effusion of its rear limbs. It has been sacrificed for behavioural disturbances. During the dissection of the left stifle (femoropatellar compartment), two yellow intra-articular floating bodies, still attached to the synovial membrane by a white strand, were observed. These two specimens were submitted along with fragments of the synovial membrane for histologic examination. One was smooth, oblong and measured 4.5 × 3 mm. The other was irregular, granulated and bilobed. It measured 4 × 4 mm (Fig. 1). The articular cartilage surface was within normal

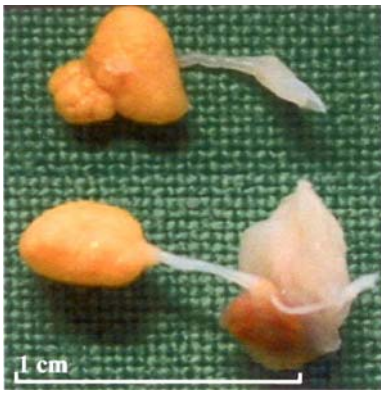

Fig. 1. Macroscopic picture of the rice bodies. The shape and size of those structures vary slightly but both are pedunculated, attached by a thin white strand and composed of a nodular yellow tinted body.

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limits. The synovial membranes were slightly red discolored. Upon dissection of the articulation, there was an increased blood oozing at the junction between the articular surface towards the calcified cartilage and underlying bone without any visible modification of the articular cartilage itself. The total volume of the synovial liquid of the left stifle was more abundant compared to the contralateral joint. The contralateral joint was macroscopically normal.

A histologic examination of a sample of the synovial membrane that was isolated from the left femoropatellar joint, revealed mild changes. The synovial membrane was of adipose type with most synovial villi core consisting of adipose tissue and sparse fibrovascular tissue. Some villi cores were however composed mainly of collagen and vessels. At the base of those villi or within them, few vessels showed thickened hyalinized walls and more occasionally neutrophils and lymphocytes infiltrate. Otherwise, there was no evidence of an inflammatory context. The rice bodies consisted of polypoid structures lined by unremarkable synoviocytes. The synoviocytes rested on collagenous tissue, siege of lymphocytes and histiocytes infiltration, comprising some multinucleated giant cells phagocyting ceroid pigments (Fig. 2). The center of the core was composed of necrotic adipose tissue. The more regular rice body was submitted still attached to the synovial membrane. The synovial membrane at this level had thickened fibrous villi, one focus of nodular cartilaginous metaplasia, and foci of fat degeneration and necrosis with ceroid and hemosideric pigment deposition. Within this area, some arteries had thickened walls with proliferated smooth muscles (Fig. 3).

In various rheumatoid disorders, multiple free-floating intra-articular particles, also named oryzoid bodies or corpora oryzoidea, may be present. In humans, they mainly involve the knee and the shoulder and may adhere to the synovium [1]. They are described as tiny, white coloured, cartilage-like bodies. Histologic evaluation shows mainly organized fibrin and collagenous nuclei surrounded by a thin fibrin layer. The rice bodies found in this study do not correspond to the description of the human rheumatoid rice bodies. They were yellowish due to ceroid pigments and the adipose tissue, not detected in rheumatoid rice bodies. They macroscopically did not look like cartilage. Remberger [7] described rice bodies as detached fibrinoid or hyalinic synovial villi. He observed chondroid metaplasia and concluded therefore to an association with osteochondrosis dissecans. We can exclude that our fragments originated from osteochondrosis dissecans as the articular surface was free of lesions and our fragments did not contain bony tissue. Furthermore, we doubt the above-mentioned hypothesis, because De Bari *et al.* [3] proved the capacity of synoviocytes to undergo phenotypic modifications towards cartilage, whereas osteochondral fragments do not show such signs of metaplasia. We suggest that the formation of these rice bodies is induced by ischemia and consecutive atrophy at the base of the villosities. Bonnet and Walsh [2] attributed the increased oozing of the cartilage/bone junction to an increased vascularization due to osteoarthritis. The increased oozing that we observed during the dissection of the stifle may be induced by local hypertension illustrated by the vascular hypertrophy observed within the synovial membrane. The chondroid metaplasia that we observed has been described in rheumatoid arthritis [6]. Several investigators have suggested that rice bodies arise from microinfarctions after intra-articular synovial inflammation and ischemia [1,5]. The vascular changes (hyalinization, thickening of the wall, smooth muscle proliferation), the hemosiderosis, the fat necrosis and the replacement of the adipose tissue by collagen in some synovial villi lead us to support that ischemia is the pathway of rice body formation. Synovitis is commonly considered to be an initial change in joints of athletic horses and associated to repeated trauma. Here, the two rice bodies deriving from synovium might indicate the

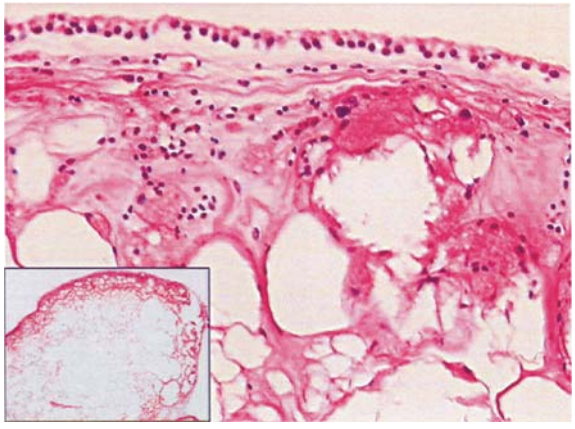

Fig. 2. The rice bodies is mostly composed of benign necrotic adipose tissue. Mild fibrosis, edema and histiocytic infiltration may be seen underneath the synoviocyte lining. H&E stain, ×200. Inset, ×10.

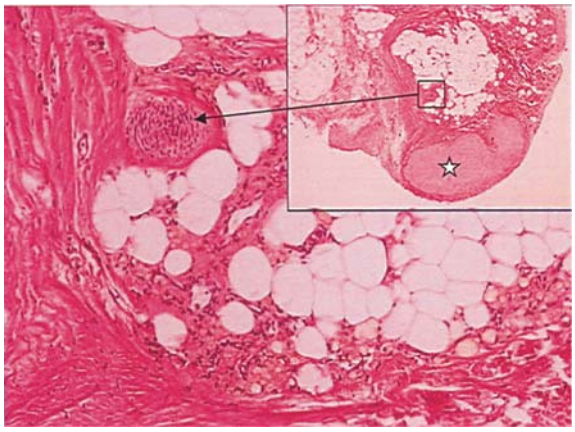

Fig. 3. Picture of the synovial membrane at the base of the second body. Observe the nodular cartilaginous metaplasia (star), and the thickened arteries (arrow). H&E stain, ×100. Inset, ×10.

beginning of an articular suffering or a compensated synovitis without obvious effects to the articular cartilage.

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