

DEGENERATIVE ARTICULAR CHANGES INDUCED BY CUTTING  
CRUCIATE LIGAMENTS IN PORCINE STIFLE JOINT.  
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Locomotoric disturbances seriously affect reproductive efficiency of breeding pigs, and are the most important single cause of culling of breeding pigs (Sabec et al. 1980). It is generally accepted that the most important cause is bone and joint lesions, and osteochondrosis (OD), the most common lesion underlying the syndrome "leg weakness" (Reiland et al. 1980). According to Grøndalen (1981), the etiology of leg weakness is complex, and one should know the detailed problems in question before proposing preventive initiatives.

Less attention has been paid to early articular changes preceding the osteoarthrosis (OA). The purpose of a research of this kind is to obtain a better understanding of the development of OA with, as final goal, the finding of means to prevent or cure the disease. Since Paatsama (1952) had shown that cutting of the canine anterior cruciate ligament resulted in OA, many mechanical injuries of different kinds have been used to induce an experimental OA (Telhag 1972, Hulth 1980). In the present study, the cruciate ligaments of growing pigs were cut.

At the beginning of the experiment the pigs, altogether 14, were 7-8 weeks old and weighed 15-20 kg. The cruciate ligaments of the right stifle joint were cut and the medial meniscus was partially resected. The left knee was used as control. Post-operatively there was a positive drawer sign in all knees which were operated on. Clinical and radiological examinations were made every second week. The pigs were sacrificed 9-12 weeks after operation. Angiography of the hind legs was performed prior to the sacrifice. Macroscopical examination of the joints were made before bone specimens were taken.

For examination of the bone formation, oxytetracycline bone labelling was used.

For histologic studies, specimens were stained with Hematoxylin-eosin and Delafield staining.

The radiographs revealed lipping of the metaphyseal border and slight broadening of the growth plate in the area of the patellar fossa four weeks postoperatively. Subchondral bone in the femoral condylus showed radiopacity. The distal patella showed a clearly marked radiolucent area in the insertion place of the patellar ligament. In the tibial insertion places of the cruciate ligaments a bone resorption was observed.

Eight weeks postoperatively, the growth cartilage was more broadened and the metaphysis widened with lipping phenomenon. The subchondral condylar bone trabeculae displayed radio-opacity extending deep towards the epiphysis. The patella showed a larger radiolucent area than before. An osteophyte formation was seen on the tibial surface. The caudal part of the growth plate was broad with lipping formation and a caudal condylar radiolucent defect. Twelve weeks postoperatively, the subchondral trabeculae were radiodense in places, radiolucent in

places, thus indicating ostitis rarefaciens et condensans.

Both arteriography and epiphyseal osteography revealed a demonstrable increase in the arterial supply as well as in the venous outflow at the area involved.

In macroscopic studies of the joints, condylar erosion defects were found. The patellar fossa showed a larger erosion. The sagittal sawed specimens showed thick articular cartilage and erosion areas. No remarkable osteophytes were found but thickening of cartilage and small cleavage formations extending to the subchondral bone resembled OD.

Histologically, erosions of cartilage were observed. The metaphyseal slipping phenomenon resembled osteophyte formation. Thickening of the cartilage and cleavage formation were the most remarkable changes.

The thick articular cartilage and subchondral bone trabeculae found in the present study differed from the findings of Paatsama and Sittnikow (1974) who examined early changes in the experimental canine OA. The early changes in the porcine stifle joint resembled more OD than OA found in dogs.

#### Conclusions:

In the growing pig degenerative joint disease seems to develop with changes resembling osteochondrosis which is the most common cause of leg weakness in slaughter pigs. Consequently, osteoarthrosis is not a remarkable problem until in breeding pigs. The incidence of OA in breeding animals might decline if the incidence of OD is on the decrease.

Selected references: Grøndalen, T.: Nord. Vet.-Med. 1981, 33, 417; Hulth, A.: Calcified Tissue Int. 1980. Suppl. 31, 25; Paatsama, S.: VMD Thesis, 1952. Coll. Vet. Med., Helsinki; Paatsama, S., and Sittnikow, K.: Acta Radiol. 1972. Suppl. 319, 169; Reiland, S., Ordell-Gustafson, N., and Lundheim, N.: Proc. I.P.V.S. 1980 Congress, 328; Sabec, D., Zagožen, F., Urbas, J., and Šubelj, J.: Proc. I.P.V.S. 1980 Congress, 331; Telhag, H.: Clin. Orthop. 1972, 86, 214.