

IS SUBCHONDRAL CYST AN INDICATOR FOR OSTEOBLAST DYSFUNCTION IN KNEE OSTEOARTHRITIS?

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INTRODUCTION: Subchondral bone cyst (SBC) is a key radiological feature in advanced OA. The presence of SBC was reported in a relation to the risk of cartilage loss and total knee arthroplasty (TKA). Whilst the link between SBCs and bone dysmetabolism in hip OA was studied, their links in knee OA remain unknown. Therefore we try to elucidate the relationship between SBC and subchondral bone disturbance from tissue and cellular levels in knee OA.

METHODS: A total of 104 advanced OA patients who underwent TKA were recruited in the study. Bone parameters were measured in μ CT. OA osteoblasts gene expression levels of interleukin 6 (IL6), osteocalcin (OCN), osteopontin (OPN) and osteoprotegerin (OPG) were measured by qPCR.

RESULTS: SBCs of diameters ranging from 2.5mm to 12.5mm were present in 75.8% of the study population, higher than 22.6% as detected by X-ray. OA trabecular bone with SBC has a lower BMD and higher bone volume fraction. It might be explained in part by the histological findings that specimens with SBC have more de-novo bone than their SBC-free counterparts. The IL6, OPG and OPN expression levels in SBC-positive osteoblasts were elevated in the preliminary qPCR data, while OCN level was reduced.

CONCLUSION: The prevalence of SBCs in knee OA had been underestimated clinically. With lower BMD, higher bone volume, increased inflammation and de novo bone formation, SBC should be treated as a radiological indicator for the status of subchondral bone disturbance and osteoblast dysfunction.