Controversies in Treatment of Symptomatic Osteochondral Defects of the Knee

Surgical treatment choices for symptomatic chondral and osteochondral defects of the knee have been controversial in several regards. Firstly, which lesions should be addressed surgically? Secondly, what should the first line treatment be? Thirdly, do the results of some of the more expensive treatments justify the difference in cost? And fourthly, does primary treatment choice affect the outcome of salvage surgery if this is required? This report will summarise the latest evidence that clarifies the answers to some of these questions.

Chondral and osteochondral defects of the knee are common. Approximately 60% of arthroscopies of the knee demonstrate the presence of such a lesion. However, not every lesion is symptomatic. Any osteochondral or chondral surgery will only be effective if the knee is normally aligned and stable. If malaligned, corrective osteotomy may be required (with or without cartilage defect surgery). The knee should be stable, or stabilised by ligament reconstruction. Abnormal shearing across the chondral surfaces will disrupt any repair tissue. Articular cartilage surgery is ineffective in the presence of inflammatory arthropathy or where there is no meniscal tissue remaining.

The critical size of chondral or osteochondral defect of the knee that will biomechanically degenerate is >0.8 cm² diameter. This raises the question of whether asymptomatic defects over this size should be treated opportunistically when they are observed. There is currently no long-term evidence regarding opportunistic treatment of asymptomatic lesions, and it is an area that requires investigation.

Symptomatic defects can have a magnitude of symptoms as severe as end stage osteoarthritis of the knee and often occur in patients of working age. It is reasonable to undergo a period of active conservative management: physical therapy, weight management and activity modification, to assess whether a new lesion will become asymptomatic. However, it is not reasonable to leave patients with symptoms of pain, catching, swelling and disability for prolonged periods of time. Treatment choice needs to be made in the context of the patients’ co-morbidity, activity level, ability to comply with rehabilitation and their expectations. All types of chondral and osteochondral treatments fare worse in patients with a BMI >30 and in smokers. Improvements in these parameters will result in a better outcome for the patient holistically, as well as for the knee intervention and should be discussed with the patient. The size of the defect also needs to be assessed in the context of the size of the knee. A 2cm diameter lesion may constitute the diameter of a whole condyle in a small knee. The size of the lesion is determined post debridement of redundant unstable flaps of chondral tissue and until a stable rim of viable cartilage is obtained.
Lesions over 2cm² have the most emphatic long-term evidence. There is more long-term evidence available for ACI than for any other treatment of chondral and osteochondral lesions. Cell therapy is currently the most effective long-term surgical treatment option in lesions >2cm².

Figure 1: From Mistry et al6 shows the results of 4 pooled ACI studies versus three pooled MF studies. Four pooled ACI studies versus three pooled MF studies.

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The cost of ACI is within the cost framework (incremental cost-effectiveness ratio) that is acceptable to the NHS as a funder. This may be of help with providing evidence to health funders to gain approval for cell therapy where the evidence is clinically indicated.

In all size of defects, first line treatment with cell therapy may have the most effective long-term outcome. However, most of the studies of cell therapy are in larger lesions. Therefore there is still some controversy in treatment of lesions 1-2cm² due to lack of published studies of cell therapy in smaller defects. Breaching of the subchondral bone, subsequent healing with scarring and thickening of the subchondral bone plate and the possibility of intraslesional osteophyte certainly compromises the effectiveness of salvage surgery in larger lesions11. This may also be the case in smaller lesions, but there is not yet the evidence base gathered to prove this conclusively.

In summary, many of the previous controversies regarding surgical management of chondral and osteochondral lesions of the knee are being resolved with evidence. Some controversies still exist that need us to gather data; these include the most effective treatment for lesions 1-2cm², opportunistic treatment of asymptomatic lesions and the use of regenerative techniques in early osteoarthritis.

References

References can be found online at www.boa.ac.uk/publications/JTO or by scanning the QR Code.
References


