

Is ACI a success? Current evidence and trials in progress

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In Google you will get over 100,000 web pages from a search on 'autologous chondrocyte'. The paper in 1995 by Petersen, Lindahl and Brittberg began a revolution in orthopaedics with many consequences. It is not that large numbers of surgeons or patients were affected, but orthopaedics was brought to the forefront of tissue engineering. New possibilities of treatment were opened up.

Another aspect of AC has been the way it challenged accepted dictum of the inability of cartilage to heal. This has fed the emotional debates that surround the histology of ACI. Is true hyaline cartilage formed?

Many new treatments arrive in orthopaedics, become fashionable, and pass – as John Hunter said, 'nothing is as vicarious as surgical fashion'. Most new treatments are started by a champion, often with commercial support, and progress on the basis of a personal series, eventually a gathering of other individual series and occasionally fade as reports of complications increase. Orthopaedic surgeons appear more concerned than many specialties about the cost of procedures. Most of our procedures are highly cost-efficient as measured by QUAYS, but criticism of ACI was also partly of the apparent high cost. This has not proved to be significant when assessed by cost benefit, but studies are very limited.

Many treatments have become popularized since the advent of ACI, including mosaicplasty and microfracture. An excellent randomized trial by Hubbard on simple debridement has never been challenged in a trial, but there is a natural instinct to 'try and do something', and therefore something more, with the assumption it will be better than simple debridement. Is there good evidence?

Only one randomized multicentre trial has been reported and this is the study by Gnutzen and the dedicated group of Norwegian surgeons with 80 patients who must all be congratulated

on showing us the way. The problems with clinical trials in orthopaedics are numerous.

Vague end-points, the need for long term studies of at least 10 years, differences in technique, and learning curves all make trials very difficult. Results so far from Norway are inconclusive. Larger trials are probably needed. The MRC in the UK is funding a 660 patient study where independent observers will hopefully provide sufficiently accurate measures of outcome to come up with an answer. European funding of 'Myjoint', a collaboration between Keele in the UK and Kiel in Germany, is to build on the science of ACI to investigate the possibility of growing a living joint in the Latissimus dorsi of the patient. The aim is to allow a joint to grow in the security of the patient with Autologous cells and over a sufficient time to become mechanically strong and suitable for transplantation into the arthritic joint.

So although the clinical trial evidence is not strong for ACI, it has been successful in drawing a lot of resource to improve treatments of localized cartilage loss, and in the long term I believe advances the possibility of a biological joint replacement.