A comparison between autologous chondrocyte implantation and cartilage progenitor therapy in the healing of chondral defects.

Charles W. Archer[1] and Mauro Alini[2]

[1]School of Biosciences, Cardiff University U.K. and [2]AO Institute, Davos, Switzerland.

Arguably, the 'gold-standard' of the biological repair of chondral defects is antilogous chondrocyte implantation (ACI). However, a major limitation of the technique is that the size of the defect to be treated is limited by the amount of chondrocytes that can be generated that maintain chondrogenic potential. In humans, chondrocytes expanded in monolayer culture lose their chondrogenic potential after around 7 population doublings. We have isolated a progenitor cell population from articular cartilage that maintains chondrogenicity through over 40 population doublings thus generating ample cells for potential repair application and for treating much larger defects.

We have initiated a large animal study to compare ACI with cartilage progenitors in a chondral defect model in goats. We have conducted and completed a pilot study and the main study that will last 20 months is underway. I shall present the data from the pilot study together with the design of the main study. I will also briefly describe our work in humans that shows that similar cells exist in adult human cartilage.