Chondral or osteochondral lesions of the shoulder may lead to premature osteoarthritis of the glenohumeral joint as regeneration of damaged articular cartilage is lacking. Rising health awareness, increasingly active populations and improvements in medical techniques have increased the application of cartilage regenerative minimally invasive approaches for glenohumeral joint preservation or delayed prosthetic replacement. In contrast to the conclusive and mostly convincing mid-term results of cartilage regenerative techniques known for the knee, clinical results of innovative therapeutic approaches with glenohumeral cartilage defects are more or less absent. Current techniques include procedures for mesenchymal stem cell recruitment, such as microfracturing, (autologous) osteochondral transplantation, (matrix-associated) autologous chondrocyte transplantation and biological resurfacing, addressing focal chondral defects up to massive structural osteochondral defects. With increasing arthroscopic applicability, they evolve to important tools in the armamentarium of the shoulder surgeon. Future clinical data will determine evidence-based applicability, enabling standardized treatment selection.