Orthobiologics to Aid Healing of Rotator Cuff Injuries

Due to the limited regenerative capacity of tendon-bone junctions, rotator cuff injuries have a high rate of retear after surgical repair.

Stronger post-repair tendon-to-bone attachment might be achieved by augmenting surgery with orthobiologics, but this needs to be further evaluated.

Materials that were found to augment healing:

- **Platelet-rich plasma**
  - Inflammation
  - Maximal abduction strength
  - Wound healing
  - Tenocyte differentiation
  - Extracellular matrix synthesis

- **Mesenchymal stem cells (MSCs)**
  - These cells have the ability to transform into other connective tissue cells, thereby assisting:
    - Orthopaedic and soft-tissue healing
    - Regeneration
    - Surgical outcomes

- **Bone marrow aspirate concentrate**
  - This concentrate contains:
    - Autologous MSCs which can be utilized quickly and easily
    - Growth factors
    - Anti-inflammatory mediators
  - Growth factors
    - Bone morphogenetic protein
    - Improved healing of tendons
    - Transforming growth factor
    - Load-to-failure ratio
    - Semiquantitative composite histologic score

- **Scaffolds**
  - These form the base for deposition of minerals and matrix, resulting in:
    - Accelerated rates of recovery
    - Minimal complications
    - Retear rates

- **Amniotic tissue-based products**
  - These may:
    - Inflammation
    - Promote scarless healing
    - Amniotic fluid may contain MSCs as well

Further clinical studies are needed to effectively evaluate the efficacy of these methods and to determine which, if any, are capable of achieving strong and complete tendon-bone repair.