1) Scaffolds for Tendons Regeneration
   a) Biocompatible and Biofunctional
      i) Ability to promote cell adhesion, proliferation and differentiation, ECM components synthesis, and consequently
         the tissue formation and ingrowth
   b) Biological scaffolds and patches
      i) Biological and natural scaffolds versus synthetic scaffolds
      ii) Major challenge of tendon tissue engineering
         (1) Finding material & structure that mimicks the stiffness, ductility, non-linearity & viscoelastic of native tissue
      iii) Three forms of tendon scaffolds
         (1) Xenografts
            (a) Extracellular matrices derived from either xenogenic or allogenic material
            (b) Excellent 3-dimensional (3D) scaffolds for tissue engineering
            (c) Utilized for the surgical regeneration of musculoskeletal, dermal, cardiovascular, & gastrointestinal tissues
            (d) Graft-Augmentation Devices
               (i) Used to provide immediate protection
               (ii) Intended to be temporary, just until the complete tissue recovery
               (iii) Most used commercially available products
         (2) Allografts
            (a) Allogenic matrices are produced by the de-cellularization of cadaveric material from humans
            (b) Capable of bridging soft tissue defects while reducing the risk of graft rejection
            (c) Biological Devices
               (i) Acellular scaffold
               (ii) Cellular layer, non-denatured collagen membrane
            (iii) Types
               1. Membrane from the small intestine submucosa (SIS) of pathogen-free pigs
               2. Produced from foetal bovine dermis or Porcine dermal tissue
               3. Derived from equine pericardium
               4. Produced from human cadaver by retaining native EC architecture & vascular channels
         (3) Synthetic Grafts
            (a) Synthetic Devices
               (i) Allows the host tissue’s incorporation
               (ii) Types
               1. Poly-Lactic Acid, Polyester, Polypropylene, Polytetrafluoroethylene, Polyurethane
            (b) Artificial Prosthetic Devices
               (i) Developed to fully replace tendon when no other options
               (ii) Few options due to demanding mechanical requirements
   c) Advantages of options
d) Disadvantages of options

2) Review of Current Research

References:
1. A prospective, multicenter study to evaluate clinical and radiographic outcomes in primary rotator cuff repair reinforced with a
3. Biologic Treatments for Sports Injuries II Think Tank—Current Concepts, Future Research, and Barriers to Advancement, Part 2:
6. Outcome of Large to Massive Rotator Cuff Tears Repaired With and Without Extracellular Matrix Augmentation: A Prospective