TISSUE ENGINEERED HEART VALVES

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PROBLEM

• Heart Valve Disease
  • Stenotic Valve
    • Chest Pain, Fatigue, Heart Palpitations, etc.
  • Regurgitant Valve
    • Heart Murmurs, Fatigue, Heart Palpitations, etc.
  • Mitral Valve Prolapse
    • Dangerous heart rhythms, heart infections, other complications
  • Etc.
• Five million Americans diagnosed every year
• 1668 John Mayow observed constriction of the mitral valve
• 1706 William Cowper did research into aortic valve regurgitation
• 1952 First mechanical valve implanted by Dr. Charles Hufnagel
HISTORY (CONT.)

- 1960 new type of valve, Starr-Edwards ball valve
- Late 1960’s Tilting discs were introduced
- 1979 Bileaflet valves introduced
PROCEDURE

• First an allogenic heart valve conduit is acellularized
• Conduit then seeded
• Resulting valve is then surgically implanted
• Tissue engineered valve should be accepted by the body and begin to grow into the spot of the heart valve it replaced, and over time heals
• Procedure can also be done with a polymer scaffold
• Results of animal testing were very successful

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<th>MFB</th>
<th>Calc</th>
<th>Infl</th>
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LIMITATIONS

• Takes time to grow the new valve
• Human trials have yet to be successful
• Still requires surgery
• Polymer scaffolds showed progression of regurgitation and stenosis over time
FUTURE DIRECTIONS

• Creating a better polymer scaffold
• Clinical Trials


