Development of Test Method for Implant Delivery Wire

TEAM E

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Project Summary

Boston Scientific developed a medical device called the WATCHMAN that helps reduce stroke risk in patients by sealing a small area in the heart called the left atrial appendage. An implant is delivered through a thin wire that must be strong yet flexible enough to move through veins. To better understand the wires behavior, our team created a test fixture that pushes the wire through a tube simulating a vein. A digital force gauge will then measure the applied forces across the wire when the wires tip hits the end of the tube. When the wire bends at the tip under a load, the "buckling" or bending point is recorded on video and software for analyzation.

Design Constraints

1. Must replicate realistic wire motion and bending behavior
2. Adjustable test angles between 0 degrees and 105 degrees to simulate real use
3. Measures peak and steady-state force at 0.1 lbf resolution
4. Fits existing mount and uses standard interfaces
5. Swap samples in under 5 minutes without tools

Design Goal

Our goal is to design a reliable test method and fixture that measures how much force an implant delivery wire can handle before it bends or "buckles". The system must allow repeatable, controlled tests that somewhat represent how the wire would behave when used inside the human body during implant procedures.

Figure 1: Initial Final Proposed Fixture

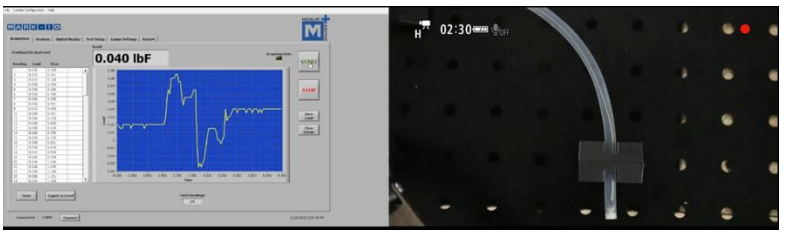

Figure 2: Initial force testing and test method procedure for applied on implant delivery wire.