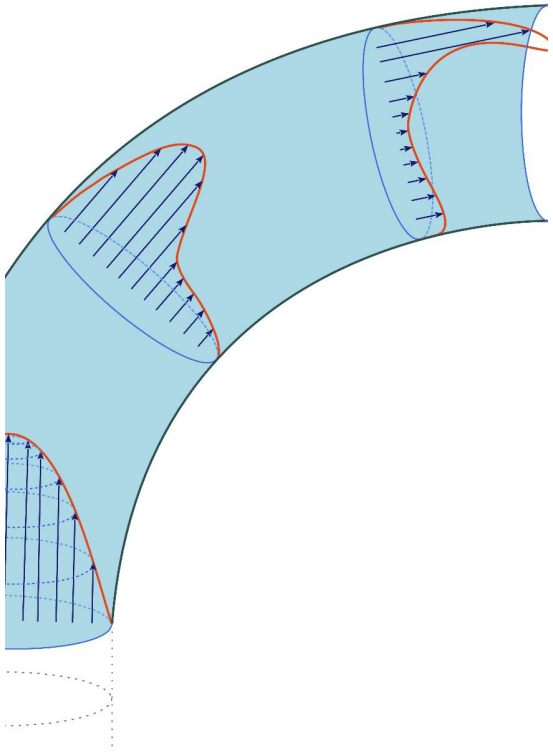
TATA ELXSI

CASE STUDY

Hemodynamic Study of Blood Flow in Arteries

Optimised failure of stents through CAE simulations



BACKGROUND AND CHALLENGE

There were various reasons contributing to failures of stents – for instance, in-stent restenosis, endoleaks, and loss of device structural integrity. It was also necessary to identify the most effective location to place the stent where there were multiple blockages present in the artery.

SCOPE OF WORK

- Create CAD proposals with various unit shapes and sizes for the stents
- Verify mechanical strengths of the created proposals
- Study blood flow in the arteries in various situations and understand stresses on vessel tissue

SOLUTION

- Made a thorough hemodynamic analysis of blood flow in the artery
- Ran CAE simulations to understand mechanical properties of various designs of stent fitted in the artery

IMPACT

- Established criteria to check mechanical strength of stent virtually
- Established an effective stent design in relation to vessel tissue
- Predicted in-stent restenosis due to mechanical failure in the design stages itself

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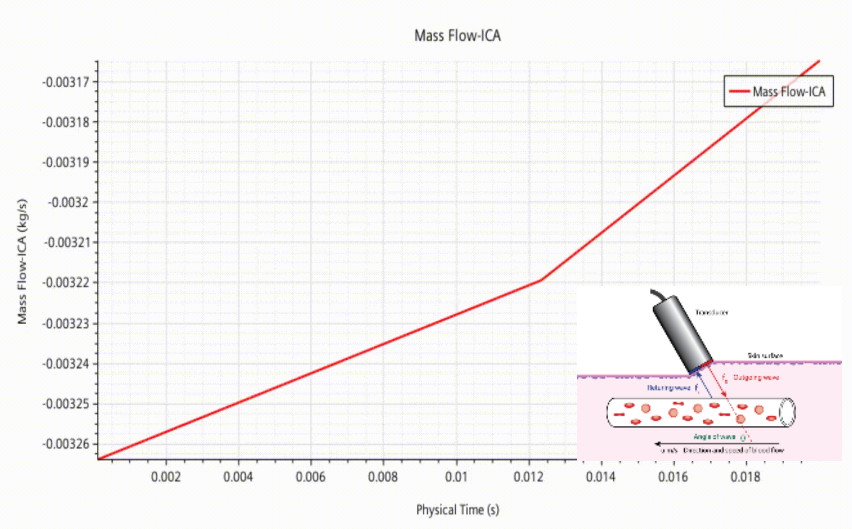
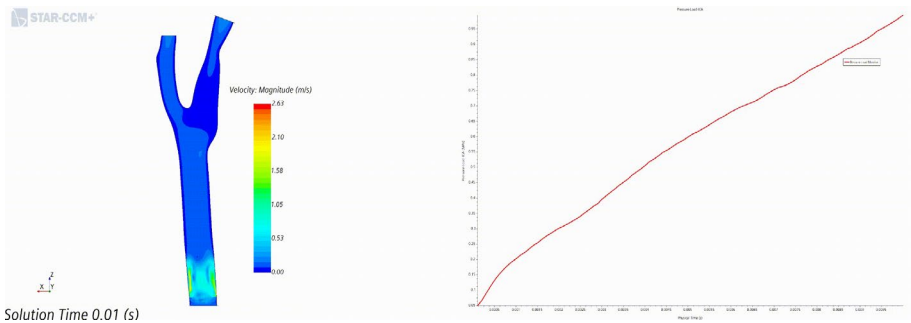
CFD

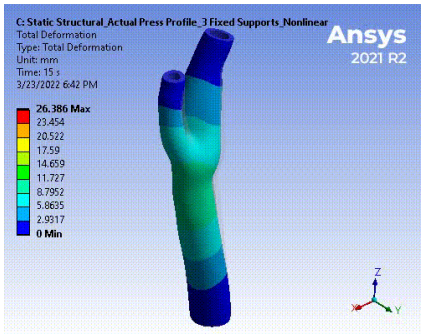
Mass flow from Doppler Ultrasound

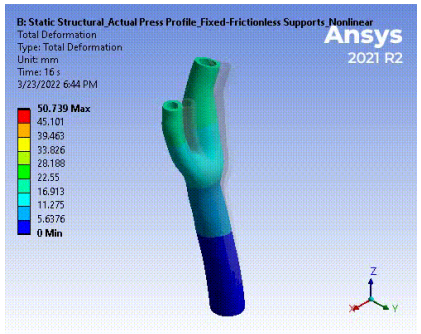


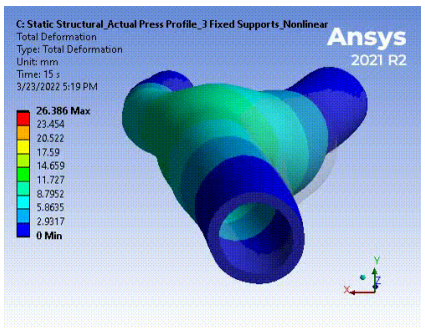
CFD: Pressure Extraction

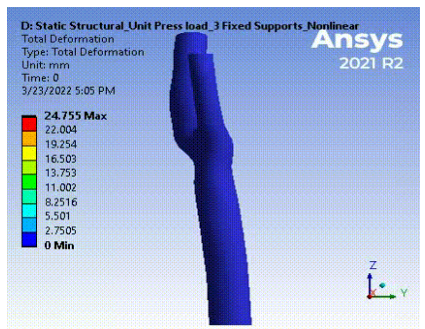


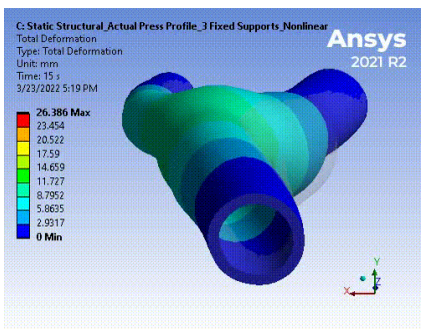
CAE

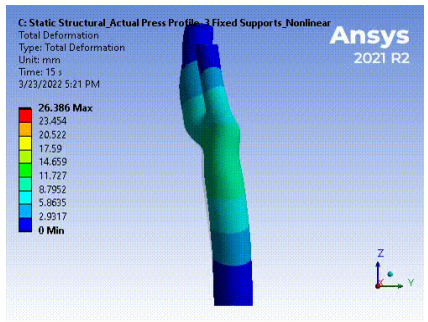












info@tataelxsi.com