

Estimation for Mechanical Properties of Intravascular Stents

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Laboratory



Introduction

Aneurysm generated to cerebral vessel wall

Arterial Diseases

Thrombus generated to arterial vessel wall

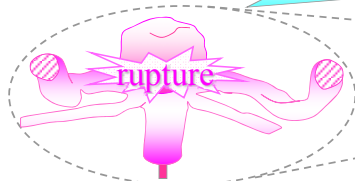


Fig.1 Illustration of brain aneurysm.

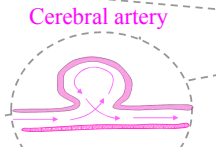


Fig.2 Cross-section view of the vessel in the aneurysm.

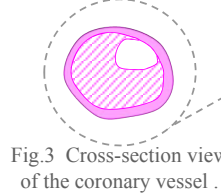


Fig.3 Cross-section view of the coronary vessel.

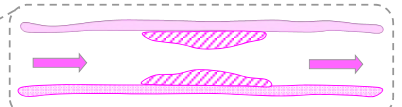


Fig.4 Illustration of coronary artery.

Pathogenesis of **subarachnoidal hemorrhage** with high mortality

Pathogenesis of **arteriosclerosis**

Study Contents

Finite Element Analysis

Model Create

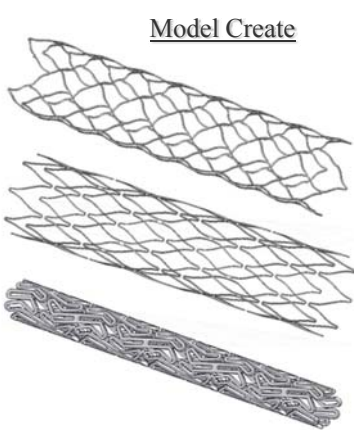


Fig.5 Geometries of the stent models.

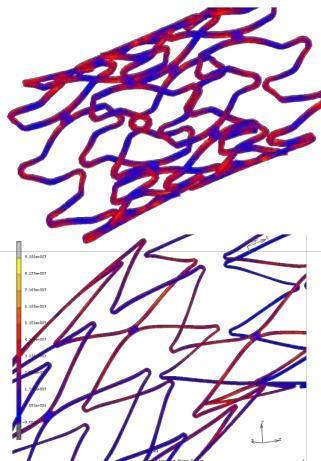


Fig.6 Results of FEM analysis.

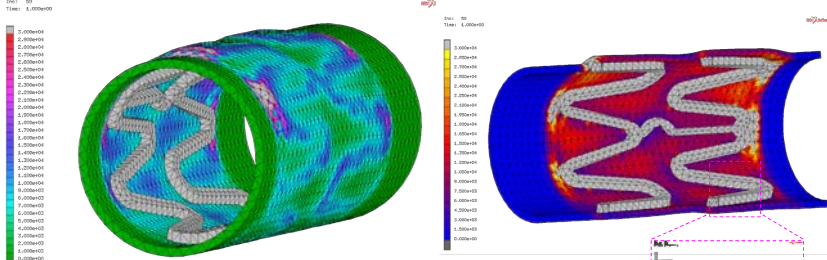


Fig.7 FEM Analysis results of stent-vessel interaction.

Computational Fluid Dynamics

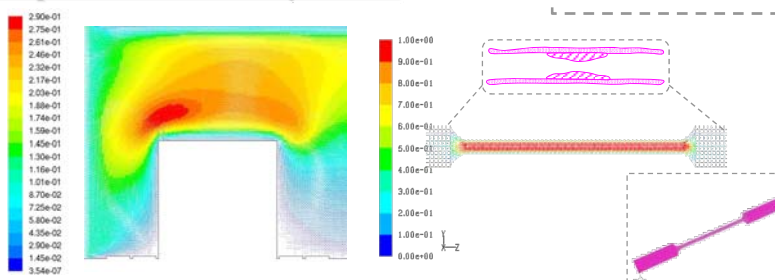
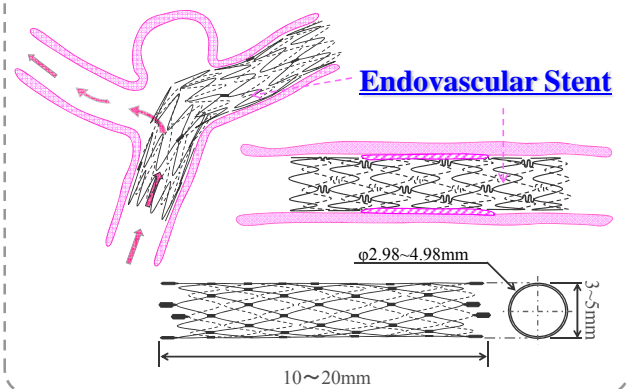


Fig.8 Velocity distribution of CFD analysis.

Endovascular treatment with stent



Suggestion of the **design condition** for Endovascular stent

Mechanical Tests & Prototype Fabrication

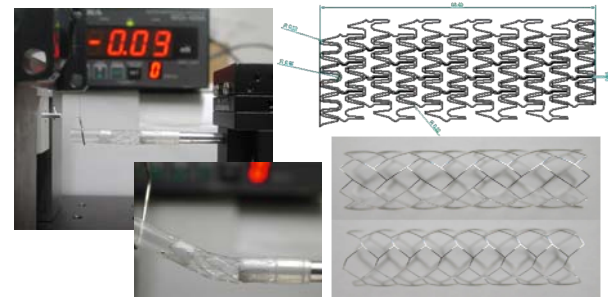


Fig.9 Image of mechanical test (left) and prototype (right).

Assessment of **stent mechanical behavior** using original prototype

Future issues

- Study of **stent - vessel interaction** from biomechanical view.
- Fluid experiment using realistic aneurysm model with PIV and LDV.

Evaluation of **stent performance** using numerical simulation