Guidelines for VISC 09, Sendai, August 2009

Goals

- To discuss between medical doctors and CFD engineers to select artery
- To provide a preliminary clinical validation of CFD as a treatment planning tool
- To assess whether CFD models predict clinical outcomes

Case

Only 2 cases. Bifurcation aneurysm

Stent

We provide two pre-patient data and teams will propose treatment plans:

1) silk like stent (figure)

Study

The teams will produce an independent analysis showing:

- Select left, right or other artery to put the stent.
- The hemodynamic calculation after the suggestion from your medical doctors with two cases.

(Therefore, the participants calculate only 1 data in each case)

NOTE!!: You should not calculate the cases without stent to expect the placing stent. All you can do is the calculation with stent after your doctor recommendation!

Two persons in all participants are invited to show your data:

We will then use the results to:

- Compare treatment plans provided by the different teams and verify their consistency
- Verify that the plans predicted the same outcome and compare with the real outcome

Communications

1. Please download the application form and fill with it. Send the form by email to visc09@biofluid.ifs.tohoku.ac.jp
2. We will send you a zip file named as visc09.zip, including 2 patient stl files (visc09_okd.stl and visc09_sr.stl) , and stent stl file (visc09_stent.stl) by You SendIt*.
3. Discuss with doctor and select the artery to put the stent.
4. Calculation based on the blood rheology and boundary conditions
5. Send your result based on the result condition by You SendIt*.
6. We select two persons for invited speakers.
7. Please attend visc09 session in ICS09.

*You SendIt: Freeware package, http://www.yousendit.com/

Geometry

Figures show the geometries.

Blood rheology

A simple model for blood rheology with constant density and viscosity is adopted. The units are specified following the International System of Units (SI).

1. Blood density: 1000 kg·m-3
2. Blood viscosity: 4·10-3 kg·m-1·s-1

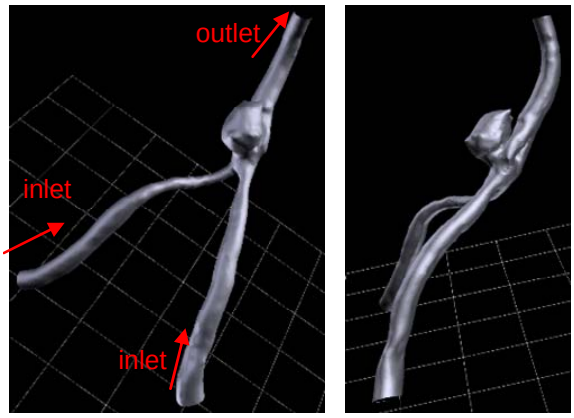

Image of visc09_okd.stl (left: PA, right:

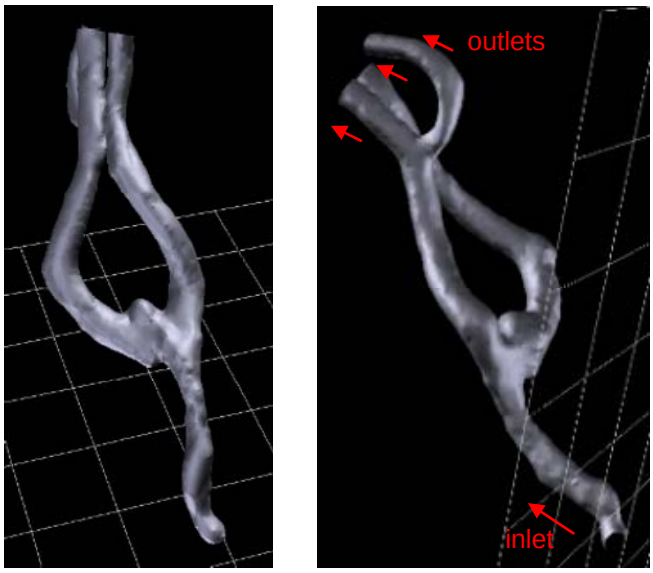

Image of visc09_sr.stl (left: PA, right: Lateral)

Boundary conditions

A simple flow condition with steady flow is adopted. The units are specified following the International System of Units (SI).

1. Wall boundary condition: rigid, no-slip
2. Inlet boundary condition: uniform velocity profile, flow rate = 2.36·10-6 m3·s-1
3. Outlet boundary condition: uniform pressure, p=0

Results

Please send your data based on **AVS*** to visc09@biofluid.ifs.tohoku.ac.jp via **You SendIt**:
The put your name to your file name.

1. static pressure
2. Blood velocity
3. WSS
4. Mesh

*AVS: Advanced Visualization System (http://www.avs.com/)
We will send you the sample format with the STL files.

Deadlines

Call for participation and open forum	March 1, 2009
Deadline for sending patient data to participants	April 30, 2009
Sending back the report on numerical approach and CFD simulation results received	April 30, 2009
Invited speakers	May 15, 2009
ICS09 in Sendai, Japan	August 5th–7th, 2009

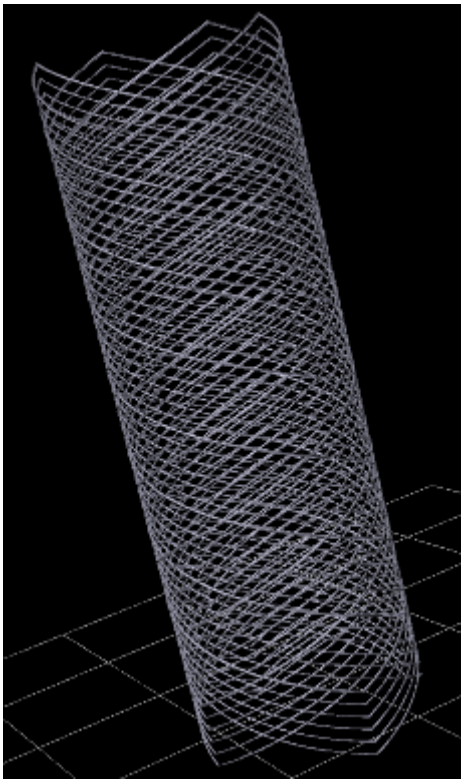

Figure: Stent image