Supplemental Material

Appendix

List of definitions and abbreviations

Collateral source	Parallel vascular network which provides *collateral connection* to the ischemic area.
R_{source}	Resistance of collateral source
P_{col}, R_{col}	Inflow pressure and resistance of the *collateral connection*
$R_{pre,}$	Resistance proximal to the takeoff of collateral connection.
R_{post}	Resistance of collateral source distal to the takeoff.
Pa	Arterial pressure
Pv	Venous pressure
Ri	Inflow resistance in the partial occlusion model or collateral resistance in collateral inflow model
Pi	Inflow pressure of the ischemic region distal to Ri or R_{col}.
$R_{pen,}$ P_{pen}	Resistance and tissue pressure in the penumbra.
$R_{core,}$ P_{core}	Resistance and tissue pressure in the core.
No reflow	Cessation of flow when P_{core}>=Pi; $rCPP_{core}$=0.
PONR= (P_{core}, Pv, Pa)	Point of no reflow- values of P_{core}, Pv and Pa at which $rCPP_{core}$ becomes zero.

For residual direct inflow pressure Pi calculation was described earlier [2].

After transition to the collateral inflow Pi is calculated for decreasing venous pressure Pv:

For $Pi>Pv>P_{core}$ and $Pi>Pv>P_{pen}$

$$Pi\_{33} = (Pa \cdot R_{post} + Pv \cdot R_{pre} \cdot R_{post} / R_{core} + Pv \cdot R_{pre} \cdot R_{post} / R_{pen} + Pv \cdot R_{pre} + Pv \cdot Ri \cdot R_{source} / R_{core} + Pv \cdot Ri \cdot R_{source} / R_{pen}) / (Ri \cdot R_{source} / R_{core} + Ri \cdot R_{source} / R_{pen} + R_{source} + R_{pre} \cdot R_{post} / R_{core} + R_{pre} \cdot R_{post} / R_{pen})$$

For $Pi>P_{core}>Pv$ and $Pi>Pv>P_{pen}$:

$$Pi\_{23} = (Pa \cdot R_{post} + P_{core} \cdot R_{pre} \cdot R_{post} / R_{core} + Pv \cdot R_{pre} \cdot R_{post} / R_{pen} + Pv \cdot R_{pre} + P_{core} \cdot Ri \cdot R_{source} / R_{core} + Pv \cdot Ri \cdot R_{source} / R_{pen}) / (Ri \cdot R_{source} / R_{core} + Ri \cdot R_{source} / R_{pen} + R_{source} + R_{pre} \cdot R_{post} / R_{core} + R_{pre} \cdot R_{post} / R_{pen})$$

For $Pi>P_{core}>Pv$ and $Pi>P_{pen}>Pv$:

$$Pi\_{22} = (Pa \cdot R_{post} + P_{core} \cdot R_{pre} \cdot R_{post} / R_{core} + P_{core} \cdot R_{pre} \cdot R_{post} / R_{pen} + Pv \cdot R_{pre} + P_{core} \cdot Ri \cdot R_{source} / R_{core} + P_{core} \cdot Ri \cdot R_{source} / R_{pen}) / (Ri \cdot R_{source} / R_{core} + Ri \cdot R_{source} / R_{pen} + R_{source} + R_{pre} \cdot R_{post} / R_{core} + R_{pre} \cdot R_{post} / R_{pen})$$

For $Pi<P_{core}>Pv$ and $Pi>Pv>P_{pen}$:

$$Pi\_{13} = (Pa \cdot R_{post} + Pv \cdot R_{pre} \cdot R_{post} / R_{pen} + Pv \cdot R_{pre} + Pv \cdot Ri \cdot R_{source} / R_{pen}) / (Ri \cdot R_{source} / R_{pen} + R_{source} + R_{pre} \cdot R_{post} / R_{pen})$$

For $Pi<P_{core}>Pv$ and $Pi >P_{pen}>Pv$:

$$Pi\_{12} = (Pa \cdot R_{post} + P_{core} \cdot R_{pre} \cdot R_{post} / R_{pen} + Pv \cdot R_{pre} + P_{core} \cdot Ri \cdot R_{source} / R_{pen}) / (Ri \cdot R_{source} / R_{pen} + R_{source} + R_{pre} \cdot R_{post} / R_{pen})$$

For $Pi<P_{core}>Pv$ and $Pi<P_{pen}>Pv$:

$$Pi\_{11} = (Pa - Pv) / (R_{post} + R_{pre}) \cdot R_{post} + Pv$$