

Influence of two wall stitch mistake of microanastomosis on velocity, flow and Pulsatility index (PI)

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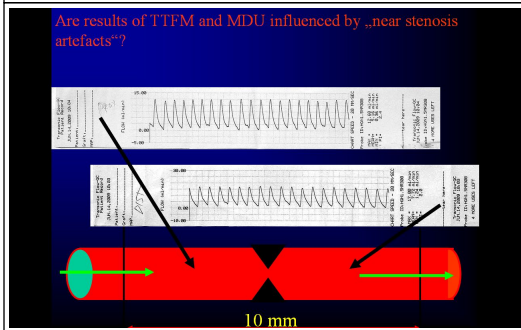
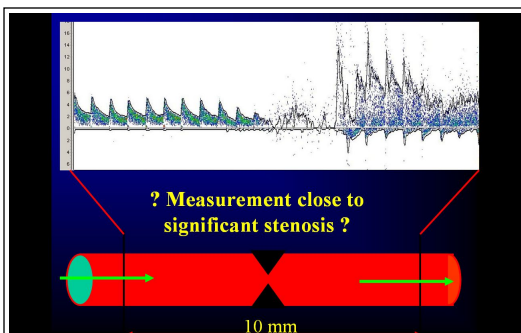
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Introduction

The aim of this study was to evaluate Microvascular Doppler ultrasonography (MDU) and Transit Time flow measurement (TTFM) in the prediction of a technical mistake during microanastomosis creation.

Two wall stitch (TWS) standardized mistake was used in a novel controlled model of the common iliac artery in rats.



STANDARD end-to-end anastomosis

- Triangulation technique
- Rules of microsurgery

TWS end-to-end anastomosis with standardized mistake **Two Wall Stitch** (Pignati et al 2004)

- Triangulation technique
- Rules of microsurgery
- Patent anastomosis with tight stenosis

Methods

A total of 18 Wistar rats (randomized to **Standard or TWS groups**) underwent measurements. **TWS** mistake anastomosis or **Standard** anastomosis was done in right iliac artery. The pulsatile flow curve, mean flow values and PI were obtained using TTFM probe Transonic HT 331. Velocity values and PI were obtained using 16 MHz probe MultiDopT. Flow in left iliac artery was measured with flowprobe just before every measurement in right iliac artery to check rats circulation. Paired t - test, two - way ANOVA and repeat measures ANOVA were used for analysis.

Rats right iliac artery	Left iliac artery
MDU: V, PI TTFM: Q, PI	Reference Q
TWS or STANDARD anastomosis	
MDU: V _{prox} , V _{dist} , PI _{prox} , PI _{dist} TTFM: Q _{prox} , Q _{dist} , PI _{prox} , PI _{dist}	Reference Q

Anastomosis with TWS technical mistake

Gender
Weight
Flow in reference artery during every measurement

Results

Group TWS (n = 10)

Anastomosis patency 100%. Time of bypass creation 21,1 min (17-31).

Mural trombus 2/10

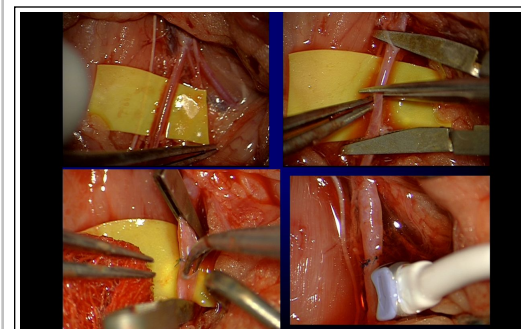
Group STANDARD (n = 8)

Anastomosis patency 100%. Time of bypass creation 20,3 min (12 - 35 min).

Mural trombus 1/8

Multiplicative influence of wall thrombus occurrence as well as classification to **TWS** group was proved using **TTFM** by decrease in volume flow measured within 5 mm in front of anastomosis. Flow volumes in bigger distance from anastomosis were not influenced by mural thrombus or TWS mistake. Significant decrease in flow in left iliac artery was detected during measurement. This decrease of rats aorta flow could have influenced measurements.

MDS in **TWS** group demonstrated a significant increase of velocity and decrease of PI in the area surrounding the anastomosis.



Discussion

Value of TTFM in detection of Two wall stitch mistake (**TWS**) - measurement close to anastomosis

- No significant change of flow
- Increase of QPI_{dist}
- Multiplicative influence of mural trombus presence and TWS for Q_{prox}

Are results of TTFM and MDU influenced by „near stenosis artefacts“?

- MDU: yes
- TTFM: no, except QPI_{dist}

Is it possible to use artefact from „near anastomosis region“ for technical mistake prediction?

MDU Yes (CAVE relative technique without absolute values in clinical practise)

TTFM In general no. But increase of Q_{prox} can detect intramural trombus in TWS anastomosis.

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