Microvascular Techniques to Treat Vascular Injuries in Small Children and Infants: Indications, Technical Tips and Results, How to Deal with Spasm

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Disclosures
• No disclosures

Be Careful What You Ask For!

Technical Considerations
• Absence of arteriosclerosis
• Small vessel diameter
• Increased risk of vasospasm

Clinical Experience
• 10 patients
• 8 arterial, 2 venous injuries
• Age range: 36 weeks gestation to 12 months
• 8 of 9 patients 13 weeks of age or less

Etiology
• 90% injuries the result of invasive procedures performed on the affected vessels
  • Cardiac catheterization  3
  • Arterial line placement  3
  • Direct arterial ligation  1
  • Femoral vein injury  1
  • Intra-arterial infusion  1
  • Trauma  1
Etiology

- Femoral arterial line
- Femoral artery catheterization
- Umbilical artery catheterization
- Surgical ligation
- Brachial artery thrombosis
- IV infiltrate

Color Flow Doppler Examination

- Evaluation in 70% cases (7/10)
- 6 patients had operative intervention
- Doppler results verified intraoperatively in all cases
- 1 patient with preoperative arteriogram demonstrating accuracy of diagnosis

Results

- No significant limb loss despite prolonged ischemia times
  - 1 patient with toe amputations
- 7 of 10 patients survived
  - 1 early postop mortality
  - 1 late postop mortality
  - 1 nonoperative mortality
- Functional results good
  - 2 limb growth discrepancies
Diagnosis

• Physical exam
• Doppler evaluation
• Color doppler examination
  - Real time assessment of vessel patency
  - Determine level of occlusion
Treatment

• Acute intervention if obvious injury
• Discontinue local catheter
• Anticoagulation with heparin, if possible
• 6 to 8 hour waiting period
• Warm packs, elevation
• Intervention if no improvement in perfusion

Operative Treatment

• Wide proximal and distal control
• Complete division of affected vessel
• Proximal and distal thrombectomy using #2 Fogarty catheter
• Direct vascular repair if possible, vein grafts rarely needed
• Fasciotomy
• Postoperative anticoagulation

Tips

• 9-0 or 10-0 suture with microscope
• Interrupted sutures
• Papavarin or nitroglycerin
• Good ultrasound evaluation to confirm diagnosis and treatment
• Color flow and power doppler examination
• Determine appropriateness for operative intervention
• Operative intervention if without improvement
• Venous injuries often difficult to treat

Future

• Development of a team approach with plastic surgery, pediatric cardiology, pediatric surgery and neonatology
• Establish early intervention program
• Determining and possibly avoiding long term sequelae