Laser for Vascular Lesions

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<table>
<thead>
<tr>
<th>Infantile hemangioma</th>
<th>Port-wine stain</th>
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<tbody>
<tr>
<td><strong>Onset</strong></td>
<td></td>
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<tr>
<td>• First few weeks</td>
<td>• Present at birth</td>
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<tr>
<td>• Precursor may be present at birth</td>
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<tr>
<td><strong>Course</strong></td>
<td></td>
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<tr>
<td>• Proliferative period in first year of life, followed by <strong>slow involution</strong></td>
<td>• <strong>Does not regress</strong></td>
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<td>• Does not regress</td>
<td>• May become hypertrophic, violaceous with age</td>
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<tr>
<td><strong>Tissue</strong></td>
<td></td>
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<tr>
<td>• GLUT1 positive</td>
<td>• GLUT1 negative</td>
</tr>
<tr>
<td><strong>Classification</strong></td>
<td></td>
</tr>
<tr>
<td>• Vascular tumor</td>
<td>• Vascular malformation</td>
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Port-Wine Stain: Laser Treatment

• Pulsed dye laser is gold standard
• ~80% improve; < 20% clear completely with laser treatment
• Early treatment may offer improved treatment response and clearance
  - Chapas et al. 89% average clearance, starting treatment before or at 6 months of age

Photo: Bolognia et al., Dermatology, 2nd Edition
Port-Wine Stain Treated in Infancy
Port-Wine Stain: Other Treatments

• Deeper penetrating lasers
  – Alexandrite laser (755nm)
  – Nd:Yag laser (1064nm)

• Anti-angiogenesis medications
  – Rapamycin, investigational, not yet studied in children
Port-Wine Stain Hypertrophy

- Geronemus et al. report ~65% hypertrophied and/or nodular by 5th decade
- Mean age hypertrophy 37
- More challenging to treat
- *Why do some hypertrophy and others do not?*

Hemangioma: Role of Laser

• Proliferating lesions?
• Ulcerated hemangioma
• Involuting hemangioma
• Residual hemangioma
Retrospective Case Review of Pulsed Dye Laser With Cooling

- 90 patients, 105 hemangiomas
- Median age 3 months
- 81% near complete or complete clearance color, 64% for thickness
- Adverse effects:
  - One minor ulceration
  - 4% hyperpigment
  - 14% hypopigment

Propranolol & Pulsed Dye Laser: Retrospective Review

• 12 concurrent propranolol + PDL, 5 sequential propranolol then PDL, controls propranolol only

• More rapid and complete clearance with PDL and propranolol; lower cumulative propranolol dose for near complete clearance

• Total dose and days on propranolol similar between groups

Timolol and PDL

• **Timolol and PDL** may be better than timolol or PDL alone
  
  - Park et al. case review 102 patients with 111 superficial IH. Mean improvement 47% timolol only, 66.5% timolol and PDL

Laser for Ulcerated Hemangioma

- David et al. 78 patients, 91% response to laser alone, mean 2 treatments (585nm)
- Kim HJ et al. 22 children, 50% improved, 18% no response, 5% experienced worsening

Residual Lesion: When to Intervene?

- 15-40% left with residual lesion
- Most IH do not continue to involute significantly after age 3.5 (Couto RA et al.)

Ablative Fractional Resurfacing for Involuted Hemangioma Residuum (Case Series)

Hemangioma Progression

Tollefson MM, Frieden IJ. Pediatrics 2012;130:e314-e320
Can Very Early Treatment Prevent Proliferation?