# Laser for Vascular Lesions


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| | Infantile hemangioma | Port-wine stain |
|---|---|---|
| **Onset** | • First few weeks<br>• Precursor may be present at birth | • Present at birth |
| **Course** | • Proliferative period in first year of life, followed by **slow involution** | • **Does not regress**<br>• May become hypertrophic, violaceous with age |
| **Tissue** | • GLUT1 positive | • GLUT1 negative |
| **Classification** | • **Vascular tumor** | • **Vascular malformation** |

# 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

Chapas AM, Eickhorst K, Geronemus RG. *Lasers Surg Med* 2007;39:563-368.

# 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 5$^{th}$ decade
- Mean age hypertrophy 37
- More challenging to treat
- *Why do some hypertrophy and others do not?*

Geronemus RG, Ashinoff R. *J Dermatol Surg Oncol* 1991;17:76-79.

# 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


Rizzo C, Brightman L, Chapas AM et. al. *Dermatol Surg* 2009;35:1947-54.

# 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

Reddy KK, Blei F, Brauer JA. *Dermatol Surg* 2013;39:923-933.

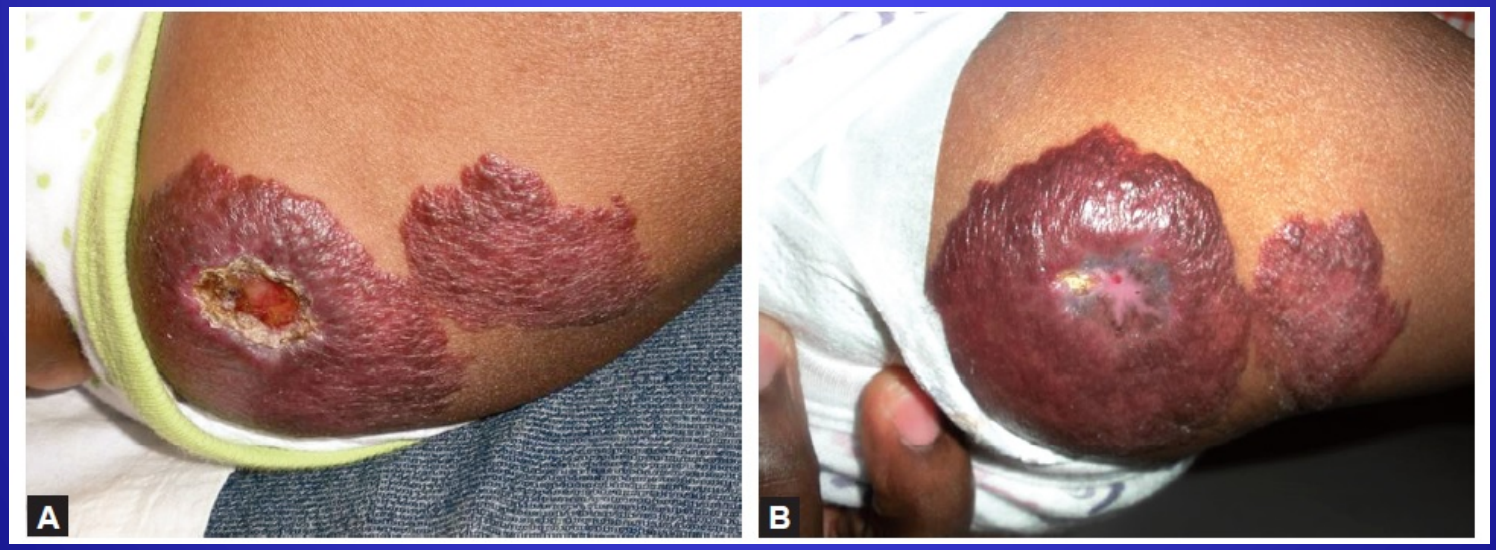
# Timolol and PDL

- **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

Park KH, Yang YJ, Chung HY et al. *J Dermatolog Treat* 2014;29:1-3.

# 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




David LR, Malek MM, Argenta LC. *Br J Plast Surg* 2003;56:317-27.
Kim HJ, Colombo M, Frieden IJ. *J Am Acad Dermatol* 2001;44:962-72.
Rubin I. In: Avram MM, Friedman PM, eds. Laser & light source treatments for the skin, 2014.

# 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.)

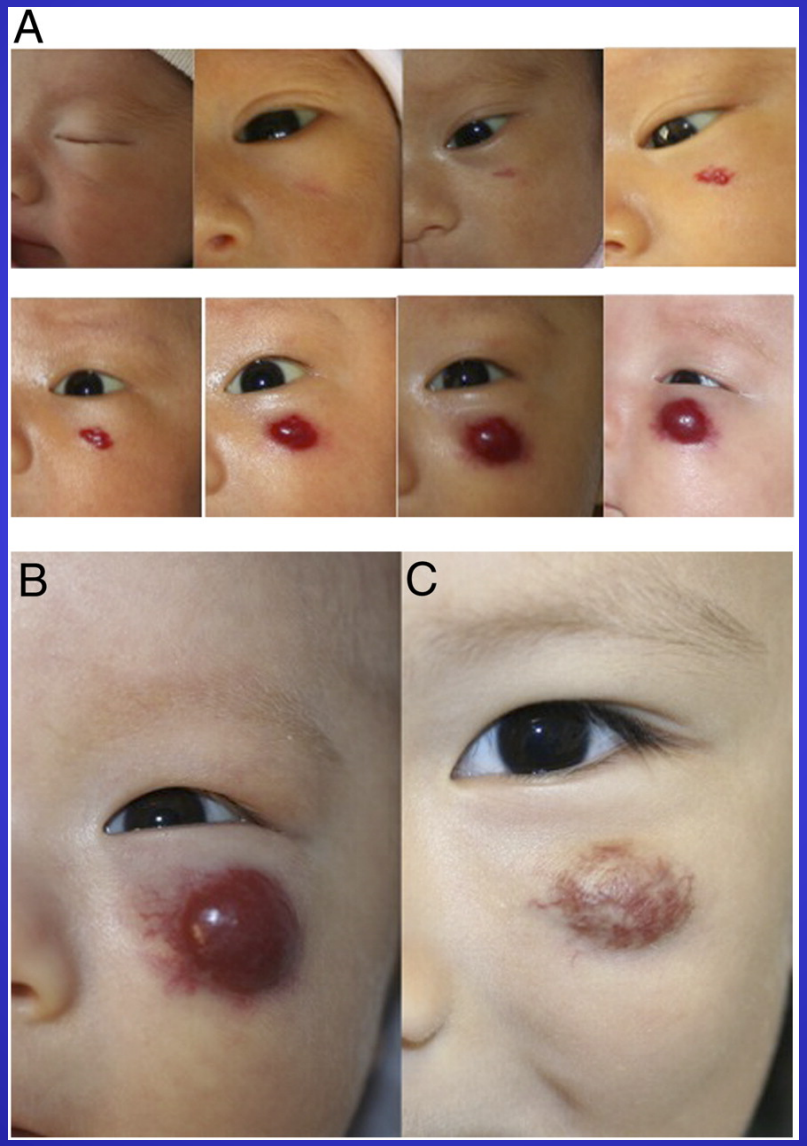
Couto RA, Maclellan RA, Zurakowski D et al. *Plast Reconstr Surg* 2012;130:619-624.

# Ablative Fractional Resurfacing for Involuted Hemangioma Residuum (Case Series)



Brightman LA, Brauer JA, Terushkin V et al. *Arch Dermatol* 2012;148:1294-1298.

# Hemangioma Progression




Tollefson MM, Frieden IJ. *Pediatrics* 2012;130:e314-e320

# Can Very Early Treatment Prevent Proliferation?