Temporoparietal fascia with PDS plate to repair nasal septal perforations

-- Let the nose do the work --

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Septal Perforation Repair

- Hard to do
- Unpleasant to perform
- Relatively high failure rate for elective procedure

Consult list
1. Facelift, blephs
   55 yo F, healthy

2. Rhinoplasty consult
   28 yo M, sports injury

3. Septal perforation
   55 yo M, afrin addict

4. Septal perforation
   40 yo F, Lupus
Goals of Perforation Management

- Reduce (or eliminate) symptoms
- Reduce (or eliminate) nasal hygiene regimen
- Consistent results that last
- Use a technique good for a variety of perforation sizes, locations, etiologies
Considerations

• Replace what is missing
  – Mucosa
  – Vascularized mesenchymal layer

• No compromise to breathing

• Maintain septal flap vascularity
  – Limit or avoid any cuts through flap

• Re-vascularize your repair so it will last

• Protect the repair in early stages of recovery
TPF as a graft

• Well described in ear and trauma reconstruction

Let the nose do the work!

It’s too hard to rotate and secure those flaps

Fill the hole with a scaffold and let septum remucosalize on its own

Extremely well vascularized tissue


PDS plate

- FDA approval in 2010
- Resorbs in 10-25 weeks
- Cost: ~$300/plate
- Tweedie, DJ et al:
  - Looked at PDS plate in traumatic septal deformity
  - Felt PDS:
    - Induced cartilage growth
    - Aligned new growth in a flat plane
    - Preferred 0.15mm perforated plate

Tweedie, DJ et al. Arch Facial Plast Surg 2010;12:106-113

Placement

• External septoplasty approach
  – Enhanced exposure
  – No blood supply disruption
  – More overlap with perichondrium
- Elevate mucosa from above
- Enter perforation after all possible flap elevation done
- Sharply incise at perforation margin for clean cut
Silastic sheet
1mm thick
6+ weeks covers entire repair
37 y/o F, Afrin abuse

1.1 x 0.8cm central perf

6 weeks post op visit

Repair seen through silastic sheet

Silastic removed; early mucosa
• N=17
• Avg follow-up = 6.1 months
• **Avg size: 1 cm²**
  - A-P distance = 1.1cm  (range 0.9 – 3.0cm)
  - S-I distance = 0.8cm  (range 0.5 – 1.5cm)
• **Closure rate: 17/17**
• **Resolution of symptoms: 15/17**
  - Pt #3: persistent crusting, mild obstruction
  - Pt #10: persistent crusting, mild obstruction
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High Risk Patients

Former smokers: 18%
Autoimmune (active): 12%
Diabetes: 6%
OSA 6%
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<th>Patient No.</th>
<th>Perforation size, cm</th>
<th>TPF Flap size, cm</th>
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CASE 1

• 49 yo F
• Hx DM, HTN not well controlled
• Hx remote septoplasty, current sinusitis
• central-posterior perforation
  – 2.2x1.0cm
  – exposed maxillary crest bone
  – very atrophic and thin septal flaps posterior to perforation
  – Intraoperatively, wide maxillary crest bone removed
  – flaps were not mobile and could not be closed on either side
63 yo F

c/o: obstruction, crusting, epistaxis x6 years

Central Perforation: 1.0x0.8cm

Etiology: idiopathic; hx of significant nasal trauma, also well controlled Crohn’s

PMHx: non smoker, no fam Hx
Case 3

- 62 yo F
- PM: DM type 2, allergic rhinitis, OSA on CPAP
  - Intranasal steroid spray use
- Perforation etiology: idiopathic
  - 1.2x1.0cm anterior/central
- c/o
  - Epistaxis
  - Pain
  - Crusting
  - obstruction
10 Weeks post op

Right

TPF already mucosalized

Nasal airway is patent

LEFT
Case 4

Small nose
8x9mm central perforation
-- Idiopathic --
6 months PO

RIGHT anterior septum

LEFT anterior septum

PRE

POST
Case 5

s/p septoplasty, then attempted endonasal perf repair

1.0x0.8cm central

11 months PO

RIGHT anterior septum

LEFT anterior septum
Other publication using TPF/PDS

• Flavill, M.D., (UT Southwestern)
  – Laryngoscope. 2014

• N=9
  – DTF one side, TPF on another
  – 12 weeks of silastic sheeting
  – Follow-up ~10 months
  – Closure rate 8/9
    • One failure was abberant construct of acellular dermis on one side, DTF on the other
    • 2 cases of PDS exposure
Other publication using TPF/PDS

- Lorenz Epprecht, M.D., et al. (Univ Zurich)
  - *Am J Rhinol Allergy*, 2017

- N=20
  - 2014 - 2016
  - Closure rate 18/20
  - Mix of external approach and endonasal placement
  - Follow-up ~8 months
Versatile, Reliable Technique

• Successfully Used in Patients with:
  – Hostile wound environment:
    • Systemic inflammatory processes
    • Diabetes
  – Large Perforations
  – Multiple Etiologies

• Technique advantages:
  – Reliable, less technical
  – No need to enlarge defect with rotational flaps
  – No obstruction of nasal valve from mucosal flaps
Future directions

• **Upper limit on size of perforation closure?**
  – How long to stent?

• **Expanded indications**
  – Cocaine/opioid decimated septum
  – Active smoking

• **Endonasal placement, possible endoscopic placement?**

• **Use DTF instead of TPF**
  – easier to harvest, thinner
  – Maybe not as vascularized ...

• **Gel-film instead of PDS**
  – Reduce FB time/burden
  – Will fascia pooch out ...?
Questions?