BENIGN LUMPS AND BUMPS OF THE HAND

Cara Lorentzen, MD
Idaho Hand Center
BRIEF OUTLINE

- General Post-op Considerations in Hand Surgery
- General approach to hand masses
- Ganglion Cyst
- Giant Cell Tumor of Tendon Sheath
- Epidermal Inclusion Cyst
- Pyogenic Granuloma
- Dupuytren’s Contracture
GENERAL HAND SURGERY POST-OP
TYPICAL HAND SURGERY POST-OP

- Local or regional anesthesia
  - Important to highlight expected time block will last

- Outpatient
  - Reasons for inpatient care
    - Severe infections
    - Larger joint surgery (elbow, shoulder) pain control
    - Revascularization

- Dressings
  - Surgeon dependent; most soft dressings can be removed in 48-72 hrs
  - Splints typically stay in place until surgeon removes in clinic
    - Patients may loosen ace wrap if splint/dressing becomes tight with swelling
**TYPICAL HAND SURGERY POST-OP**

- **Pain Control**
  - Very limited narcotic needs following hand surgery
  - Most minor cases do well with alternating Tylenol and ibuprofen
  - Even with fractures, we encourage patients to limit narcotic use to the first three days post-op

- **Other post op instructions**
  - Range of motion of non operative joints
    - i.e. distal radius fractures should work on finger, elbow, shoulder range of motion
  - Slings- Good for support after blocks. In general, please advise patients to stop using them after block has worn off.
REvascularization Post-op

- **Key is to avoid vasospasm and thrombosis**

- **Keep warm** (>80°F room temp, bair hugger, etc in PACU)

- Gentle elevation (avoid venous congestion)
  - Arterial insufficiency vs. venous congestion (infamous leeches)

- Avoid nicotine, caffeine, any vasoconstricting drugs

- **Anticoagulation**
  - (aspirin, dipyridamile, low-molecular weight dextram, heparin)

- **Monitoring**
  - Temperature: concerning changes include a > 2° drop in skin temp in less than one hour or a temperature below 30°C
  - Pulse oximetry: < 94% indicates potential vascular compromise
APPROACH TO HAND MASSES
Patient Evaluation:

- History
  - How long
  - Previous trauma
  - Change in size (how quickly?)
  - Pain/Associated numbness
  - Other lumps/bumps (Hands, Feet, etc)

- Inspection
  - Size, shape, color
  - Location, location, location

- Palpation
  - Tenderness
  - Mobility
  - Texture

- Range of motion
  - Decreased
  - Pain
  - Does mass move with ROM
GANGLION CYST
Ganglion Cyst

- Most common soft tissue tumor in the hand
- Mucin filled cyst
- Usually attached to the adjacent underlying joint capsule, tendon, or tendon sheath
- Occur in very typical locations but can occur at almost any joint in the hand
- Can develop slowly or quickly
- Often have a story of waxing and waning in size
Ganglion Cyst - Physical Exam

- **Inspection**
  - transilluminates (transmits light through tissue)

- **Palpation**
  - firm and well circumscribed
  - often fixed to deep tissue but not to overlying skin

- **Vascular exam**
  - Allen's test to ensure radial and ulnar artery flow for volar wrist ganglions
Ganglion Cysts - Location

- Dorsal wrist ganglion
- Volar wrist ganglion
- Volar retinacular ganglion (flexor tendon sheath ganglion)
- Mucous cyst (ganglion of the distal interphalangeal joint)
- Other ganglions
- Carpometacarpal boss
- Proximal interphalangeal joint
- Extensor tendon
- Miscellaneous locations
- First extensor compartment (dorsal retinacular ganglion)
- Carpal tunnel
- Ulnar canal
- Intraosseous ganglion
Cyst contents: highly viscous, clear, sticky, jelly-like mucin made up of glucosamine, albumin, globulin, and high concentrations of hyaluronic acid.

- May be blood tinged.
- Typically more viscous than normal joint fluid
Ganglion Cyst - Causes

- Typically attached to underlying joint capsule or tendon sheath
- Multiple theories regarding cause
  - Synovial herniation
  - New growths from synovial cells
  - Mucoid degeneration
- No definitive cause with scientific basis
Ganglion Cyst - Treatment

- Pediatric cysts - recommend observation
  - ~75% self-resolve in one year

- Adult cysts
  - Observation
  - Rupture
  - Aspiration
    - Higher rate of recurrence
    - Not recommended for volar cysts
  - Surgical excision
Ganglion Cysts - Variations

- Retinacular cyst (i.e. flexor tendon sheath ganglion)
- Mucous cyst - related to underlying DIP joint arthritis
GIANT CELL TUMOR OF TENDON SHEATH
GIANT CELL TUMOR BASICS

- Second most common soft tissue tumor in the hand
- Benign tumor
GCT- PRESENTATION

- Firm, nontender mass
- Typically on volar aspect of digits, but can be found dorsally
- Does not transilluminate
- Slow growing; often has been present for years before patient presentation
- Most commonly on radial three digits near DIP joint
- Pressure-type bone erosion can be seen in up to 5% of patients on radiographs
GCT- Treatment

- Treatment: excision
- Recurrence rate: 5-50%
EPIDERMAL INCLUSION CYST
**EPIDERMAL INCLUSION CYST**

- Occluded pilosebaceous follicles
- Typically due to traumatic displacement of epidermal cells into the dermis
- Results from a penetrating injury that drives keratinizing epithelium into subcutaneous tissues or bone
- Cells grow slowly to produce an epithelial cell-lined cyst filled with keratin
INCLUSION CYST - PRESENTATION

- Painless mass, commonly on fingertip but can occur anywhere
- Well circumscribed, firm, slightly mobile
- Flesh-colored, yellow, or white in appearance
- Firmer than ganglion cysts
- Does not transilluminate
- May have a lytic lesion of bone on plain films
  - Should consider malignancy in differential if lytic lesion is noted

- Treatment: excision; low risk of recurrence
PYOGENIC GRANULOMA
PYOGENIC GRANULOMA

- Vascular lesion
  - Excessive proliferation of capillaries
  - Often occurs at site of prior (typically very minor) trauma
  - Friable surface, bleeds easily

- Not an infection (may get a superimposed infection)

- Treatment
  - Spontaneous resolution is unusual.
  - Silver nitrate for smaller lesions
  - Surgical excision
BRIEF OUTLINE

- Historical Perspective
- Presentation
- Pathoanatomy of Dupuytren’s
- Causes
  - Genetics
  - Possible Environmental Risk Factors
- Treatment
GUILLAUME DUPUYTREN

- 1777-1835
- Son of a farmer
- Mentor: Alexis Boyer, imperial family surgeon to Napoleon Bonaparte

- Head of Dept of Surgery at Hotel-Dieu (oldest Parisian hospital) for 20 years
“THE BEST OF SURGEONS, THE WORST OF MEN”
– PIERRE-FRANCOIS PERCY

- Widely respected as an excellent surgeon with dedicated work ethic
- Preferred to be feared rather than liked
- Known to be conceited, authoritarian, dictatorial, and jealous
GUILLAUME DUPUYTREN

- Dupuytren’s Disease described in multiple other sources previously
  - Alexis Boyer described *crispatrua tendinum*
- 1st to describe the anatomic basis of disease
  - Cadaveric dissection
  - Applied surgically to 2 patients (Palmar aponeurosis fasciotomy)
Physical Examination

- Skin tightness, contour changes, dimples, nodules, cords, contractures in hand
OTHER MANIFESTATIONS

- Ledderhose disease (plantar fascia) 10-30%
- Peyronie's disease (dartos fascia of penis) 2-8%
- Garrod disease (knuckle pads) 40-50%
PHYSICAL EXAMINATION

- Garrod pads (knuckle pads, dorsal Dupuytren’s nodules)
  - Firm masses on the extensor aspect of digital joints
    - Most commonly PIP, but can be any of them
  - Found in 1/5 Dupuytren’s patients
  - Associated with more aggressive disease
DIATHESIS FACTORS

- Age of onset < 50 *** Strongest Predictor of Recurrence***
- Bilateral disease
- Knuckle pads, Ledderhose disease
- Positive family history
- Male
- First ray disease
- Involvement of more than one digit
RONALD REAGAN

40th President of the United States
PATHOANATOMY
DUPUYTREN’S DISEASE- PATHOANATOMY

- A benign proliferative disorder characterized by fascial nodules and contractures of the hand
- Nodule- >pathologic cords-> thickening/shortening of cords along mechanical axis
- Ring and small finger most commonly involved
DUPUYTREN’S DISEASE

- Myofibroblast proliferation
  - Increases in type III collagen compared to normal type I collagen
- Contractile potential of myofibroblasts cause contraction of collagenous palmar fascia and overlying skin and fingers
NORMAL ANATOMY

- Palmar skin attached to skeleton by retention ligaments (normal connective tissue)
  - Keeps skin in place for pinch and grasp

- Can be divided into regions of digital fascia, palmar digital junctional fascia, & palmar fascia

**Normal tissue named with “fascia, ligaments, or bands”**
CAUSES OF DUPUYTREN’S

Genetics vs. Environmental Factors
EPIDEMIOLOGY AND GENETICS OF DUPUYTREN’S

- Autosomal dominant with variable penetrance
- 5th-7th decade of life with 2:1 male to female ratio
  - Prevalence (in Western countries):
    - 12% at age 55
    - 21% at age 65
    - 29% at age 75
- Highest incidence in Caucasian males of northern European descent
ORIGINS OF DUPUYTREN’S

- Estimated to have begun in Viking populations as early as 7th or 8th century AD
- Vikings and Germanic tribes spread to Ireland/England and Iceland
- English/Irish settled in US and Australia
- The greater the migration from northern Europe, the higher the current prevalence

McFarlane 2002
### Table 2. Prevalence of Dupuytren’s Disease

<table>
<thead>
<tr>
<th>Study</th>
<th>Country</th>
<th>Age Group (y)</th>
<th>No. of Men</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lennox et al⁵¹</td>
<td>Scotland</td>
<td>&gt;60</td>
<td>100</td>
<td>39</td>
</tr>
<tr>
<td>Hueston⁵²</td>
<td>Australia</td>
<td>&gt;60</td>
<td>261</td>
<td>28</td>
</tr>
<tr>
<td>Mikkelsen⁴⁴</td>
<td>Norway</td>
<td>65–74</td>
<td>691</td>
<td>46</td>
</tr>
<tr>
<td>Gudmundsson et al⁵³</td>
<td>Iceland</td>
<td>65–74</td>
<td>312</td>
<td>33</td>
</tr>
<tr>
<td>Early⁶</td>
<td>England</td>
<td>65–74</td>
<td>170</td>
<td>14</td>
</tr>
<tr>
<td>Guitian⁴⁵</td>
<td>Spain</td>
<td>65–74</td>
<td>177</td>
<td>19</td>
</tr>
<tr>
<td>Egawa et al⁴⁶</td>
<td>Japan</td>
<td>60–69</td>
<td>181</td>
<td>12</td>
</tr>
</tbody>
</table>

The 7 largest series are listed. The studies were conducted in areas within a country and may not reflect the prevalence of the whole country. Note the similarity between Scotland and Australia and Norway and Iceland, as well as the lesser prevalence in England and Spain. The 12% prevalence reported by Egawa et al⁴⁶ in Asia is unique.
Some debate if it is simply more common in Caucasians (not necessarily Viking related)

Limited data from Africa, Russia, India, China
Family history of Dupuytren’s has been shown to have a stronger influence on younger age at first surgery (associated with worse disease)

- + FH = 55.9 years
- – FH = 61.1 years

55% of patients with onset between 40-49 years old had a + family history
- Compared to 17% age >80 years.

Becker 2014
GENDER GENETICS

- Area of interest given different prevalence and that incidence in women is decreased until after average age of menopause
- Palmar fascia has overexpression of androgen receptors
- TIMP-1
  - Gene implicated in Dupuytren’s
  - Lives on the X chromosome
- Estrogen suppresses collagen synthesis and metalloproteinase gene expression in response to acute mechanical stress
James Barrie

Rumored to have been influenced by Captain Hook in the character of Peter Pan.
ENVIRONMENTAL FACTORS
POSSIBLE RISK FACTORS

- Alcoholism
  - Mechanism unclear

- Antiseizure medications
  - More likely due to medications than disease as various studies have shown type and severity of epilepsy don’t play a role

- Diabetes
  - Local hypoxia with microvascular changes

- Profession (prolonged exposure to vibration)
  - Dupuytren’s original theory

- HIV
  - Studied in early 1990s, various studies for and against

SO WHAT CAUSES IT?

- Genetics likely play a key role in Dupuytren’s
- Baseline genetics may be triggered by certain factors, such as a traumatic event, alcoholism, or hypoxia due to diabetes
- Basically we still don’t know
MARGARET THATCHER
TREATMENT
INDICATIONS FOR TREATMENT

- Loss of function (tabletop & pocket tests)
- Flexion contracture
  - ADLs
  - Appearance
- Progression
  - Need to verify and document progression
  - Slow progression warrants careful evaluation of function
  - Knuckle pads, Peyronie’s, Ledderhose’s disease suggest more aggressive disease
- Contraindications to Surgery
  - Skin maceration or infection
  - Significant hand arthritis may be worsened by surgery
  - Poor patient compliance with hand therapy
TREATMENT OPTIONS

- Minimally invasive
  - Needle aponeurotomy
  - Enzymatic fasciotomy

- Surgical
  - Fasciotomy vs. fasciectomy (partial vs. total)
NEEDLE APONEUROTOMY

Beveled needle used as scalpel

©MMG 2011
ENZYMATIC FASCIO TOMY
(XIAFLEX)
SURGICAL TREATMENT

- Limited Fasciectomy
  - identify longitudinal fibers proximally
  - proceeds proximally to distally
  - identify neurovascular bundles

- Dermofasciectomy
  - removes involved skin and dermis
  - may have lower rates of recurrence
**TREATMENT COMPARISON**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Cost Effectiveness</th>
<th>Length of Recovery</th>
<th>Most Common Complications</th>
<th>Recurrence (%/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needle fasciotomy</td>
<td>Best</td>
<td>Week-weeks</td>
<td>&gt;1% skin tears</td>
<td>10-20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;1% nerve, tendon injury</td>
<td></td>
</tr>
<tr>
<td>Enzymatic fasciotomy</td>
<td>Next Best</td>
<td>Week-weeks</td>
<td>&gt;1% extensive bruising, skin tears</td>
<td>10-20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;1% tendon rupture, pulley rupture</td>
<td></td>
</tr>
<tr>
<td>Local Fasciectomy</td>
<td>Worse</td>
<td>Month-months</td>
<td>&gt;1% prolonged inflammation, delayed healing, nerve injury, loss of flexion</td>
<td>5-10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;1% amputation for ischemia</td>
<td></td>
</tr>
<tr>
<td>Dermo-fasciectomy</td>
<td>Worse</td>
<td>Months</td>
<td>&gt;1% prolonged inflammation, delayed healing, nerve injury, loss of flexion</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;1% amputation for ischemia</td>
<td></td>
</tr>
</tbody>
</table>
WHEN SHOULD I REFER?
CONCERNING FEATURES

- Rapidly enlarging
- Lytic lesions or other bony changes on plain films
- Painful
- Any concerns for neurovascular compromise
- Significant skin changes
- Solid mass (i.e. does not transilluminate)
- Patient desires removal (cosmetic, etc)
- If you have any questions regarding mass
REFERENCES
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- Eaton, C. “Dupuytren’s Disease”. Green’s Operative Hand Surgery 7th Ed.


REFERENCES


- Orthobullets.com (Used primarily for photographs)
