Dupuytren’s Contracture

Radiation Oncology Grand Rounds
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Overview

- Background
- Pathology
- Anatomy
- Treatment
- Questions
History

- A fifteenth century altar cloth from the cathedral of Holar in North Iceland
History

• First described in 1614 by Felix Plater
  • Progressive contracture of a digit
• Henry Cline (1808)
  • Contracture and thickening of palmar aponeurosis
• Guillaume Dupuytren (1834)
  • Hypothesized overuse
  • Defined anatomy, natural history and treatment of disease
History

• Baron Guillaume Dupuytren
DUPUYTREN’S CONTRACTURE

Epidemiology

• Prevalence
  • 2 – 42%

• Autosomal dominant with variable penetrance
Epidemiology

• Common in Scandinavia, Great Britain, Ireland, Australia and North America

• “Nordic disease”

• Rare in Blacks, Asians and North American Native Indians
Clinical History

- Usually appears in middle age (40-60)
- 50% > age 60
- More common in males – 7X – 10X
Predisposing Factors

• Diabetes mellitus
• Alcohol consumption
• Cigarette smoking
• Epilepsy
• Other Factors
Nomenclature

• Nodule
  • fundamental lesion of the disease
  • palpable subcutaneous lump
  • a collection of cells in a whorled pattern
  • consists predominantly of myofibroblasts
Nomenclature

• Band
  • normal palmar fascial structure

• Cord
  • a diseased band
  • contains no myofibroblasts
  • organized collagen structures similar to tendons
Myofibroblasts

- quintessential cell
- characteristics of fibroblasts and smooth muscle cells.
Anatomy – Palmar Fascia

- Fibrous skeleton
- Retinacular restraint for tendons
- Connects skin to underlying static structures
- Palmar skin does not ‘slide’
Anatomy

- Triangular fascial layer
- Fibers are oriented longitudinally
- Pretendinous cords
- Natatory ligaments
The MCP Joint

- Pretendinous cord
- Adjacent pretendinous cord (Y cord)
- Natatory cord
The PIP Joint

- Central cord
- Spiral cord
- Lateral cord
- Retrovascular cord
- Subdermal-level contracture
NATATORY CORDS

- Originates from natatory ligament
- Contracture of second, third or fourth web spaces
NV Bundle Involvement
Ask About Related Conditions

• Knuckle pads (Garrod pad):
  • deposits on dorsum of PIP joint

• Peyronie’s disease (3%):
  • deposits on dorsum of penis

• Ledderhose’s disease (5%):
  • deposits on plantar fascia
Clinical Presentation

• Differential diagnosis
  • Epithelioid sarcoma
  • hyperkeratosis and callous formation
  • localized PVNS
  • atypical contractures
  • soft tissue giant cell

Do you have a diagnosis that’s more affordable?
Differential Diagnosis: non-Dupuytren's contracture

- Associated with trauma and surgery
- 2 to 3 months after incident
- Resembles a pretendinous cord
- In line with a single digit without digital involvement
- Unilateral
Nonoperative Treatment

- creams, lotions, steroid injections, PT, and splinting
  - are ineffective
- educate patient
- When evaluating surgical candidates must consider
  - Rate of Progression
  - Loss of Function (usually PIP/MP contracture >30°)
Indications for Intervention

- Progressive contracture (hand can no longer be placed on a flat surface)
- Goal of surgery is to regain maximal hand function
- Cure is not always attainable
Indications

• MCP contracture >30
• Any PIP contracture
Enzymatic Lysis - Collagenase

• Approved by FDA in February 2010
• “Adults with Dupuytren’s contracture with a palpable cord”
• Less morbidity compared to surgery
• Less time off work
Collagenase - Xiaflex®

- Mixture of 2 purified collagenases
- Clostridium histolyticum
- The two collagenases increase the enzymatic degradation of collagen
- Relatively rapid effect
Badalamente MA et al. JHS 2000
Operative Treatment

• 3 Concerns
  • Skin Incision
  • Management of Palmar Fascia
  • Management of Volar Skin
Management: Surgical Options

- Primary surgical options include:
  - Percutaneous fasciotomy
  - Segmental aponeurectomy
  - Dermofasciectomy
  - Partial fasciectomy
  - Total fasciectomy
  - Extensive fasciectomy
Percutaneous Fasciotomy

- Done through a stab
- #11 blade is administered horizontally and then turned perpendicular to the cord
Percutaneous Fasciotomy

• Highest risk of injuring the neurovascular bundle
• Highest potential for recurrence
  • Approximately 45% recurrence within 5 years
• Palmar cords and for MP joint contracture
• Not indicated for patients with PIP contracture
Segmental Aponeurectomy

- C-shaped incisions
- Limits wound complications and joint stiffness associated with wide dissections.
- Comparable to other techniques
  - Recurrence rate of 21 percent
  - Recurrence plus extension of 14 percent.
Dermofasciectomy

- Skin and diseased tissue removed
- Indicated for recurrent and severe primary cases
- No evidence of recurrence of cords when combined with skin grafting
  - controversial
Partial Fasciectomy

- Excision of diseased tissue only
  - unaffected fascial tissue left behind
- Reported surgery for recurrence in 43 % after fasciotomy and 15 % after fasciectomy.
Extensive fasciectomy

• Involves the removal of a large area of diseased tissue, sparing the normal fascia.
• Indicated for extensive involvement of the palmar fascial complex.
Total Fasciectomy

- Total excision of the palmar aponeurosis (both diseased and adjacent normal fascia, including involved skin).
- “mentioned to be condemned because of the frequent profound postoperative morbidity”
Residual Joint Contracture

• Pretendinous cords
  • deformity at the MP joint
  • do not cause residual joint contracture

Digital cords

• cause PIP joint flexion
• result in residual joint contracture
• Gentle passive manipulation helps
  • Pull on it
• Associated with attenuation of the central slip
  • Intraoperative tendondesis test confirms imbalance.
Capsulotomy / Splinting

- Done in combination
  - residual deformity is greater than 45 degrees.
- PIP extension splinting can help restoring central slip function.
- Attempts to fully correcting severe deformity
  - dorsal dislocation of the joint.
Salvage procedures

- Indicated for
  - severe PIP deformities greater than 70 degrees
  - recurrent

- Options
  - Osteotomy of proximal phalanx
  - Arthrodesis of the PIP joint combined with resection
    - Decreases tension on NV structures.
  - Arthroplasty of the PIP joint using silastic implant
  - Amputation
Wound Management Options

- Primary closure
- Open-palm method
- Skin grafting
- Flap coverage
Primary Closure: Incisions

Most common incisions:

- Bruner zigzag incisions +/- Y-V-plasties
- Longitudinal incision closed with multiple Z-plasties.
Primary Closure: Z-plasty
V-Y plasty  Y-V-V plasty
Open-Palm Method

• Heal by secondary intention
• Good results and low complication rate including hematoma, skin necrosis, and infection.
  • Dupuytren was the first to leave the wound open after placing a transverse palmar incision.
Local Flap / Skin Graft
Postoperative Therapy

• Goals
  • Maintain correction
  • Reduce scarring and edema
  • Restore flexion and strength

• OT begins 2 days after surgery
  • Volar forearm-based splint with fingers in extension
  • Start active and passive motion immediately
  • Daytime splinting 2 weeks
  • Nighttime splinting 6 months
COMPLICATIONS OF OPEN SURGERY

- Nerve injury
- Complex regional pain syndrome
- Recurrent contracture
- Finger ischemia
- Skin necrosis
- Tendon injury
- Infection
Disease Recurrence

- Disease is controlled at genome level
- Surgical excision
  - Not a true cure
- Recurrence is more common in those with diathesis and earlier presentation
- New foci from area that has not been treated?
- Incomplete excision?
Conclusion

- Genetic condition
- Multiple options depending on severity
- Room for improvement


