



Acute Infections

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SUMMARY



- ☞ Background
- ☞ Specific Infections
 - Necrotising Fasciitis
 - Nail bed
 - Pulp
 - Web space
 - Flexor tendon sheath
 - Deep palmar spaces
 - Radial and Ulnar bursa
 - Collar stud abscess
 - Metacarpophalangeal joint

Background

- ☞ Old surgical and anatomy texts had great emphasis on the anatomy of infection
- ☞ Becoming less common (in 1st world)
 - Antibiotics
 - Medical care closer and more rapidly available
 - Better control of diabetes
- ☞ Resurgence
 - IV drug abuse
 - TB



Anatomy

- ☞ Several closed or interconnecting spaces in the hand
 - Determines location of infection
 - Clear anatomical understanding is needed for:
 - Safe treatment
 - Effective treatment
 - Infection in closed space can rapidly cause necrosis
 - Stiffness
 - Pain
 - Reduced function

Acute and Chronic

- Acute
 - Penetrating injury
 - Blade, gravel, urchin spine etc
 - Animal bite
 - Haematogenous
 - Post-operative
- Chronic
 - TB
 - Mycobacter Marinum
 - Fungal paronychia

Mycobacter and Fungal Infections

- Tend to be Chronic
- Not covered in his lecture

Principles of treating acute infection

- Swab
- Immediate Washout
- Antibiotics
- Elevation
- Splinting
- Surgical drainage
 - If needed



Antibiotics

- Depends on cause
- 80% staphylococcus
- Flucloxacillin/clindamycin
 - Penetrating injury
 - Presumed haematogenous
 - Post-op
- Agricultural
 - Add metronidazole
- Animal bites
 - NEXT SLIDE!

Animal Bites

- NB high risk of
 - Deeper structural damage
 - Crush, laceration
 - Retained pathogen in closed space
 - **CONSIDER EARLY SURGERY on all but the most minor bites**
- Microbiology
 - Dogs, cats
 - Polymicrobial!
 - Staph, strep, Pasteurella (canis; septicæ; multocida)
 - Humans
 - Staph, strep, Eikenella corrodens
- Antibiotics
 - Augmentin
 - Doxycycline



Surgical Treatment

- ☞ NB Low threshold for surgery
- ☞ Do not delay!
 - If failing to settle
 - Symptoms of ischaemia (severe pain, tingling)
 - Abscess formation
- Flexor sheath
- Worsening systemic illness



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Necrotising Fasciitis

- Surgical Emergency
 - 76% mortality!
- Predisposed
 - Diabetic
 - Immunocompromised
 - MDUs
 - Young
- Bacteriology
- Toxin producing virulent bacteria



Necrotising Fasciitis

- Presentation
 - Cellulitis
 - Rapidly advancing indistinct edge
 - Skin beyond edge shiny non pitting oedema
 - Relative sparing of skin
 - Skin has grey hue with purple blotches
 - Disproportionate pain beyond the oedema
 - Sick patient
 - Dishwasher pus



Nec Fasc

- Diagnostic tests
 - Xrays- free air
 - LRINEC score
 - Laboratory Risk Indicator for Necrotising Fasciitis
- Management
 - Clindamycin
 - Oxygen and Fluids
 - Immediate surgery
 - Radical debridement inc proximal amputation

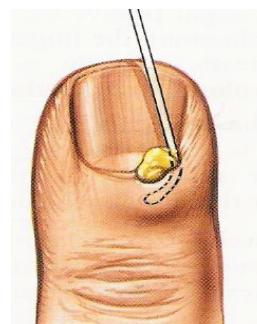
Lab	Normal	LRINEC
WBC	4-10	>12
CRP	<10	>150
Prothrombin time	<14	>14
D-dimer	<0.5	>0.5
Myoglobinuria	<0.1	>0.1
Renal impairment	<1.5	>1.5
Haemoglobinuria	<0.1	>0.1
Septic shock	<1	>1
LRINEC score	<6	>6

Nail bed Paronychia

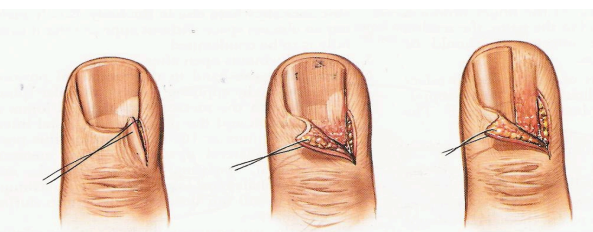
- ☞ Closed space beneath eponychial fold
 - Staph aureus
 - Occasionally chronic fungal infection (washer women)
 - Nail biters and cuticle-pickers
 - Hairdressers
- ☞ Spread
 - Along side of nail fold distally
 - Beneath the nail plate



Nail bed infection Early surgical treatment

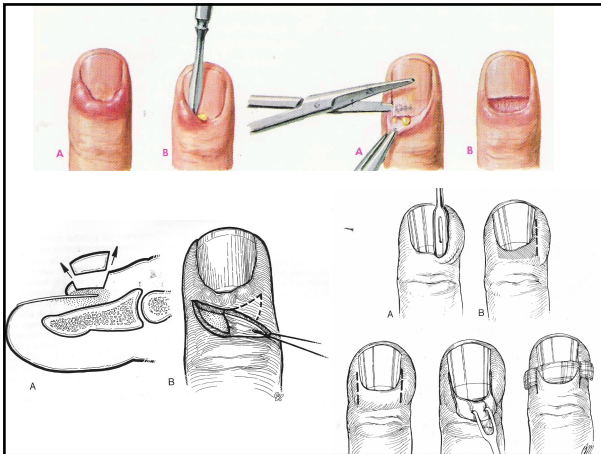


Nail bed infection Subungual spread



Entire nail fold or chronic infection





Nail bed cyst

- ☞ Connected with DIPJ
- ☞ Can develop septic arthritis if cyst is infected
- ☞ Do not pop with needle...



Pulp Space Infection Felon

☞ Cause

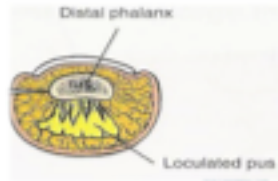
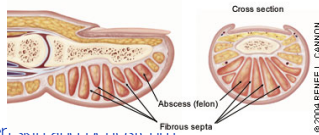
- Penetrating injury
- Often trivial

☞ Anatomy

- Fascial septae between annular and periosteum
- Form closed spaces
- Very painful

☞ Spread

- Skin necrosis
- Osteomyelitis
- Tendon sheath
- DIP joint



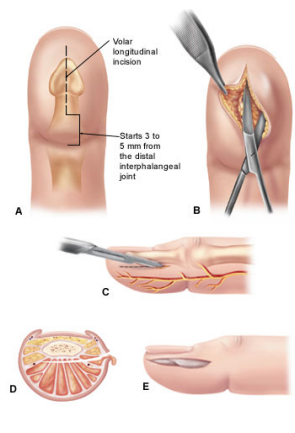
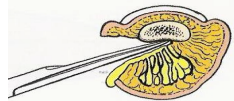
Pulp space infection Drainage

☞ Use

- ☞ Midlateral
- ☞ Midline

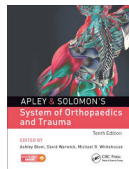
☞ Avoid

- Fish-mouth incision
- Necrosis



Herpetic Whitlow

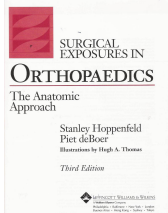
- Usually dental infection
 - Herpes simplex virus
- Presentation
 - Very painful
 - Very tender
 - Vesicles break out
- Self limiting
 - 10 days
 - Acyclovir
- Do not drain
- Recurrence
 - 30-50%
 - Tingling/painful prodrome



Web space infection



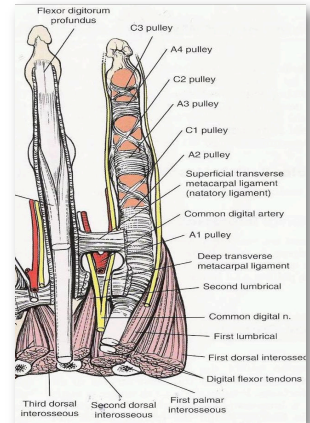
References



Web space Finger

Complex anatomy

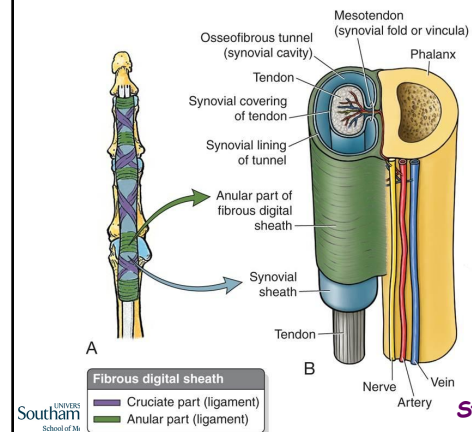
- Natoratory ligament
- Transverse intermetacarpal ligament
- Neurovascular bundle
- Lumbrical canal
 - Palmar to transverse metacarpal ligament, radial
- Interosseous canals
 - Dorsal to transverse metacarpal ligament
- Loose connective tissue



Web space Treatment

Longitudinal incision

- Avoids scar contracture
 - Loss of span
- Extensile
- Safer
 - Parallel to neurovascular bundle



Flexor tendon sheath

- Cause
 - Staph aureus
 - Penetrating injury
 - Extension from felon
 - Rarely haematogenous
 - Trigger finger injection
- Effect
 - Rapid spread in closed space
 - Tendon ischemia
 - Kanavel's signs



Kanavel's Signs

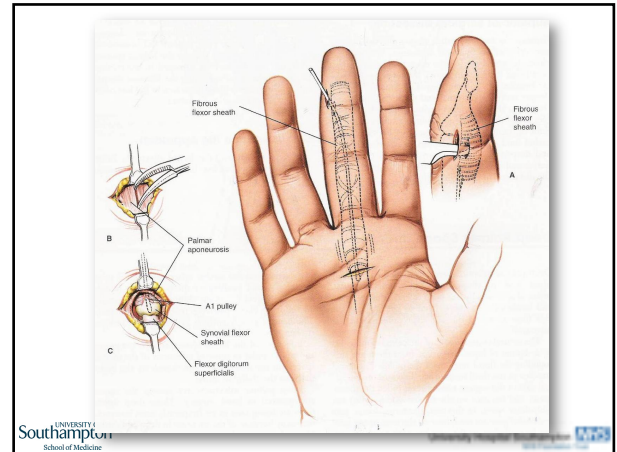
- Flexed posture of digit
- Tender along course of tendon
- Pain on passive finger extension
- Pain in active flexion

Allen B Kanavel MD FACS 1874-1938



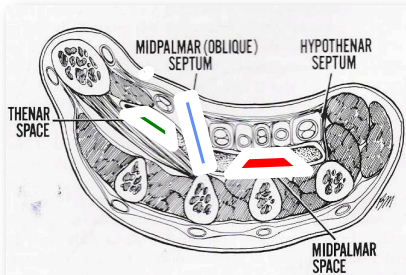
Treatment

- Elevate
- Antibiotics
- Short-term splinting
- Early surgery if not settling!



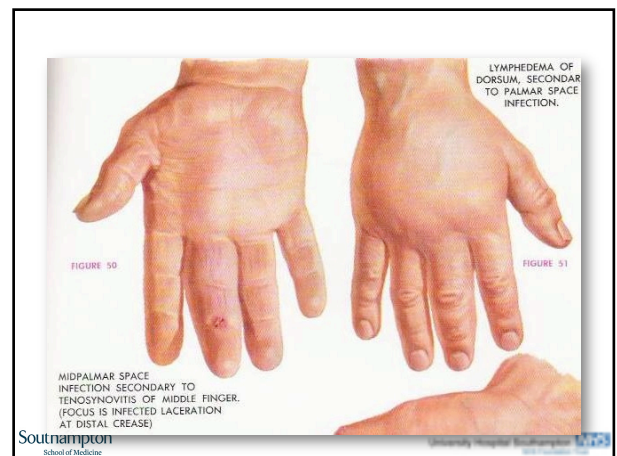
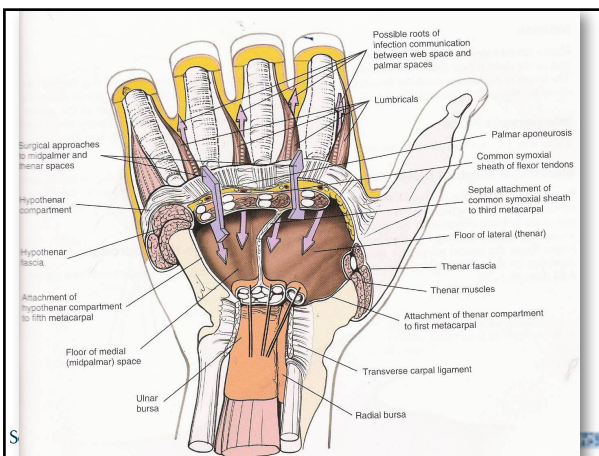
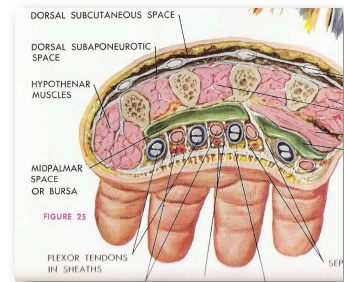
Deep Palmar Spaces

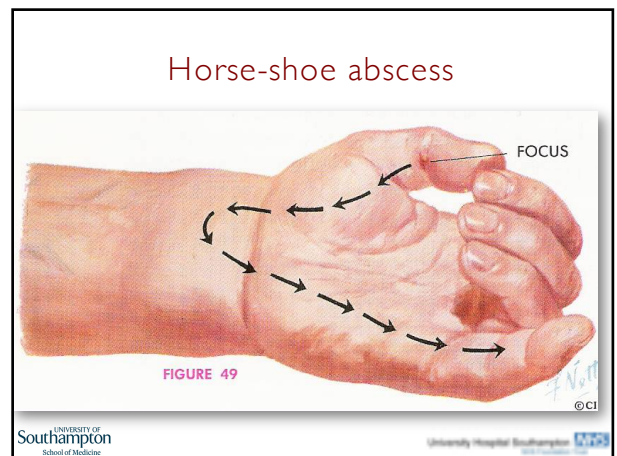
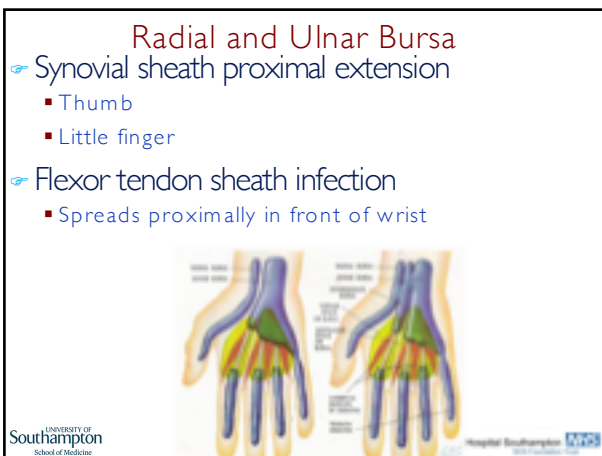
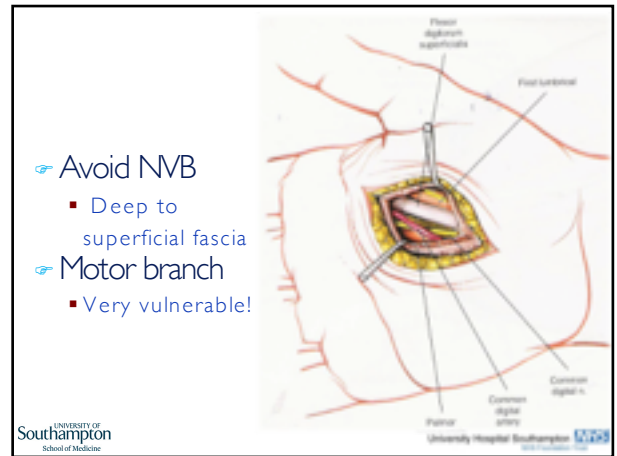
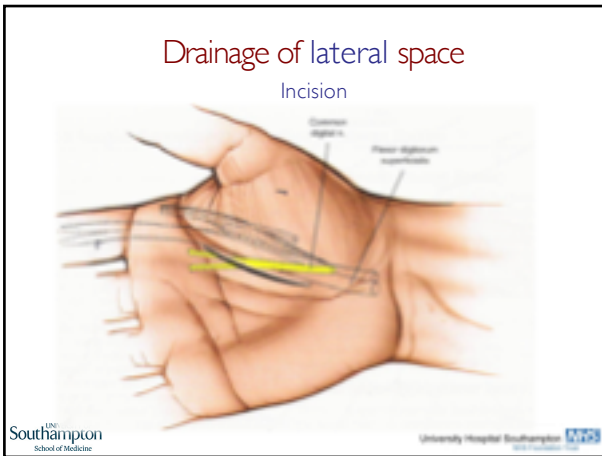
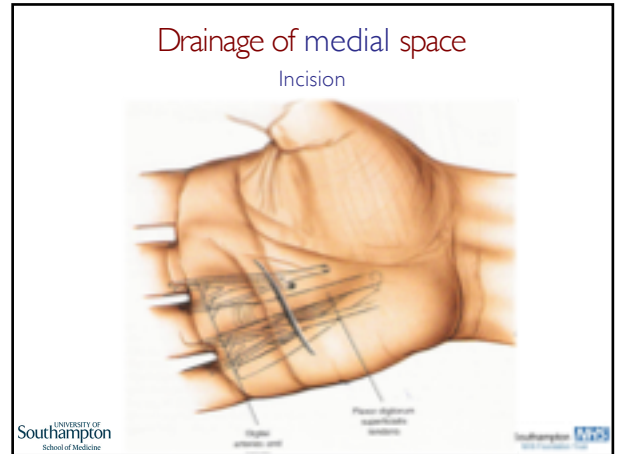
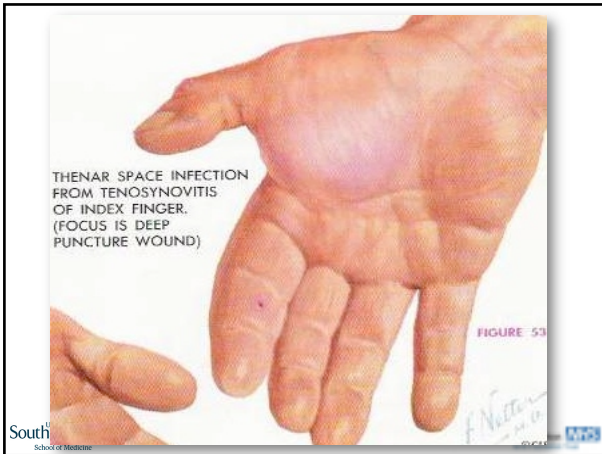
- Vertical septum from 3rd metacarpal
 - Midpalmar space = medial space
 - Thenar space = radial space



Deep palmar space infection

- Causes
 - Spread
 - Web space infection
 - Flexor sheath infection
 - Penetrating Injury

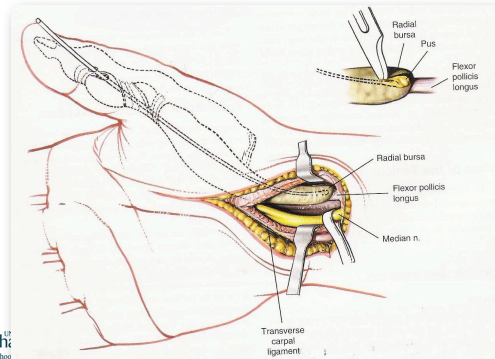




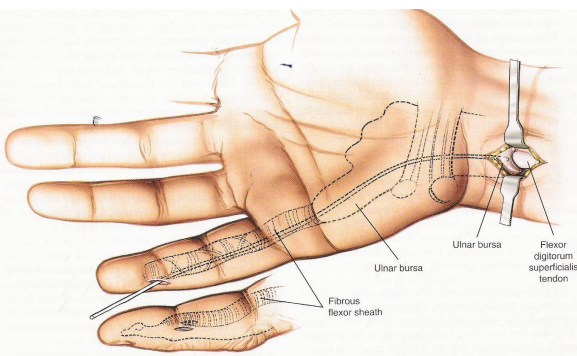
Radial bursa Thumb flexor sheath



Drainage of radial bursa

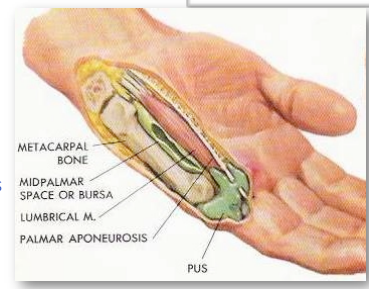


Drainage of Ulnar Bursa



Collar Button Abscess

- Subcutaneous infection
 - Palmar Gallosity
 - Blister
- Penetration
 - Palmar to dorsal
 - Through aponeurosis
- Drainage
 - Palmar & dorsal incisions

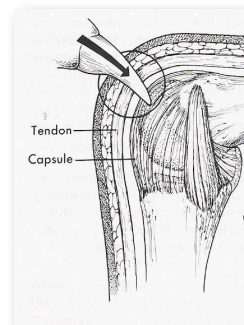


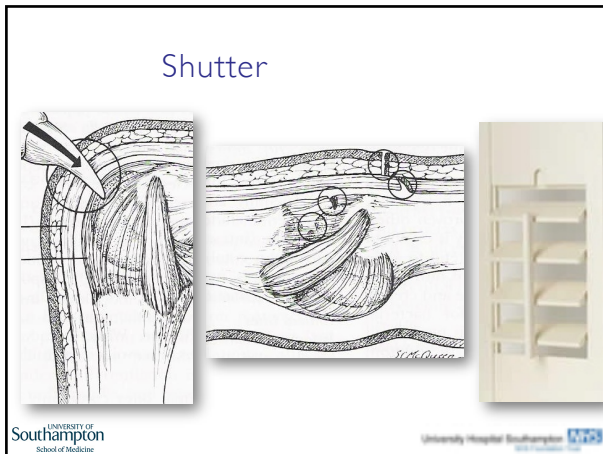
Infection Fight Bite



Fight Bite

- Tooth penetrates
 - Skin
 - Subcutaneous fat
 - Tendon
 - Capsule
 - Synovium







Consequence

- ☞ Closed space
 - Bacteria Trapped in joint as fist released
- ☞ Infective Arthropathy
 - Stiffness
 - Pain




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- ☞ Bacteria
 - Alpha Haem strep viridans
 - Eikonella Corrodens
 - Streptococcus Anginosus
 - Anaerobes
 - Prevotella
 - Fusobacterium
- ☞ Viral Transmission
 - Very rare but reported
 - Hepatitis
- ☞ Antibiotics
 - Ampicillin or Augmentin

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- ☞ High index of suspicion
 - Small cut
 - Patient tells a lie
- ☞ Wash out wound in ER
 - Saline and cannula
 - IV Antibiotics
 - Formal exploration

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Drainage

- ☞ Dorsal incision over joint
- ☞ Divide longitudinally
 - tendon, capsule, synovium
- ☞ Thorough lavage and synovectomy
- ☞ Close tendon


○ Chadaev AP, Jukhtin VI, Burkevich AT, Emkuzhev VM. Treatment of infected clenched-fist human bite wounds in the area of metacarpophalangeal joints. J Hand Surg Am. 1996;21:299-303

○ Staiano J, Graham K. A tooth in the hand is worth a washout in the operating theater. J Trauma. 2007;62:1531-2.

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