

Felon (Fingertip Pulp Infection)

Anatomy & Pathophysiology

ANATOMICAL STRUCTURE OF THE DIGITAL PULP

- A felon is defined as an abscess located in the subcutaneous tissues of the distal pulp of a finger or thumb [2].
- The distal digital pulp is divided into tiny compartments by strong fibrous septa that traverse from skin to bone [2].
- A transverse fibrous curtain is present at the distal flexor finger crease [2].
- The tight septal compartment of the pulp causes immediate pain when swelling occurs due to increased pressure within the space [2].
- The pulp space infection is characterized as a deep infection within a tight septal compartment [14].

PATHOPHYSIOLOGY AND COMPLICATIONS

- Infection in the pulp is commonly caused by penetrating injuries from foreign bodies or medical finger sticks [2].
- *Staphylococcus aureus* is the organism most commonly isolated from fingertip infections [2, 14].
- Initial clinical signs of pulp infection include swelling, redness, and pain typical of cellulitis [2].
- Abscess formation may follow rapidly after the initial signs of cellulitis [2].
- A pulp abscess can extend into the periosteum around the nail bed, causing paronychia [2].
- A pulp abscess can extend proximally through the fibrous curtain into the flexor sheath, leading to flexor tenosynovitis [2].
- Deep abscesses that are untreated can penetrate the periosteum and cause osteomyelitis or septic joint [2].
- More superficial abscesses can cause skin necrosis [2].
- Abscesses may occasionally form in the middle and proximal digital pulps [2].
- If a felon lesion is relatively superficial, the purulence may point palmarly, a condition known as an apical abscess [14].

- Complications of a felon include loss of pulp tissue, osteomyelitis, epiphyseal damage, and septic arthritis [14].

Clinical Presentation

- A felon is an abscess in the subcutaneous tissues of the distal pulp of a finger or thumb [2].
- The distal digital pulp is divided into tiny compartments by strong fibrous septa that traverse it from skin to bone [2].
- Swelling causes immediate pain due to increased pressure within the pulp [2].
- Infection can be caused by a penetrating injury from a foreign body [2].
- Infection can be caused by “finger sticks” for medical reasons, such as hematocrit and blood glucose determinations [2].
- *S. aureus* is the organism most commonly isolated from fingertip infections [2].
- Swelling, redness, and pain typical of cellulitis are present initially [2].
- Abscess formation may follow rapidly after initial cellulitis symptoms [2].
- The pulp abscess can extend into the periosteum around the nail bed causing paronychia [2].
- The pulp abscess can extend proximally through the fibrous curtain into the flexor sheath, leading to flexor tenosynovitis [2].
- Abscesses beginning deep, especially if untreated, penetrate the periosteum and cause osteomyelitis or septic joint [2].
- More superficial abscesses cause skin necrosis [2].
- Abscesses may form occasionally in the middle and proximal digital pulps [2].
- The diagnosis of an abscess in this area is sometimes difficult [2].
- An abscess is usually present if severe pain has lasted for 12 hours or longer [2].

CLINICAL EXAMINATION

- A careful physical examination is essential to direct care and future testing if indicated [1].
- Diagnostic tests such as imaging and serum laboratory studies can be expensive, time consuming, and often nonspecific [1].
- Patients often have difficulty accurately describing their symptoms and may incorrectly attribute pathology to a perceived deficit [1].
- The task of the clinician is to combine patient history with a careful physical examination to pinpoint or narrow the scope of possible pathologic processes [1].

IMAGING

- An 8-MHz Doppler tone assessment may be used to identify superficially displaced neurovascular bundles when Dupuytren cords lie beneath soft fleshy prominences [12].

- False-negatives are possible with 8-MHz Doppler tone assessment [12].
- Doppler imaging is a promising improvement for identifying structures, but higher resolution imaging technology is needed [12].
- MR assessment of Dupuytren's is hindered by the resolution of current equipment, orientation issues due to multiplanar deformities of the fingers, and lack of intraoperative availability [12].
- MRI is probably most useful in identifying additional pathology such as flexor tendon bowstringing [12].
- MRI may be helpful in providing a quantitative noninvasive measure of cellularity of affected areas, which is an index of biologic activity [12].
- The potential of MRI as a staging tool based on cellularity has not been investigated yet on a large scale [12].

References

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