

# Answers and additional information for Orthopaedic Quiz

## Q1. Ganglion cyst

Ganglion cysts contain gel-like fluid. They can occur in any joint or tendon with a tendon sheath, most often in the wrist or palm, 80% dorsal and 20% volar aspect. As the amount of the gel-like contents increases the ganglion may become painful, but the symptoms are usually mild. A small ganglion attached to a flexor tendon sheath may be sometimes painful but mostly they are painless and attract attention due to the swelling. The diagnosis of a superficial ganglion can usually be made based on the clinical picture of a soft cystic swelling which is intensely transilluminant. The ganglion is the commonest soft swelling in the hand but other conditions which are described in this quiz must be kept in mind. The diagnosis is confirmed by ultrasound or by the gel-like contents at needle aspiration. MRI is unnecessary.

Treatment is necessary only if the ganglion causes pain or other inconvenience. About half of wrist ganglia resolve spontaneously within a year. In children, 80% resolve. (Calif E.: JPO. 2005; 14-(B): 448). If the ganglion persists management available are:

- inject the local anaesthetic and then crush the ganglion by pressing strongly with the thumb or a book (preferably Grays Anatomy or Campbells' whichever comes handy. In fact legend has it that in not so medieval time. the church priests used to whack it with a bible and that cyst used to be called 'Bible cyst' or 'Giddeon's cyst.
- needle aspiration- Make a puncture in the ganglion and aspirate it empty.
- If the ganglion causes symptoms, it can be excised (open excision or arthroscopic). Arthroscopic method produces a smaller scar but the recurrence rate after needle aspiration or surgery is about the same (10 to 20%).

I prefer the first option that some call traditional, others call it a bit barbaric, which is to smash the ganglion with a hard object such as a book. Because the cyst wall is disrupted, recurrence may be less than aspiration. However some may feel uncomfortable with their doctor whacking a book against their wrist!

Dias (2003) studied 155 patients with palmar ganglia and found recurrence rate as 42% after excision, 47% after aspiration and 48% without intervention (JHS.28-B(2):172,2003). Surgery had 20% complication rate but some in untreated group found the swelling unsightly. Exploration of the swelling in the 5 year old-boy shows a multiloculated cyst extending to the radio-carpal joint within the carpal tunnel compressing the median nerve (Figure.1). This explains the pain he had over the fingers. The stalk must be excised to prevent recurrence.



## Q2. Giant Cell Tumour of tendon sheath (GCTTS)

GCTTS is a soft tissue mass often found in the hand. It arises from the synovium of large or small joints, or from synovial sheath of tendons usually of the fingers. Different terms: GCTTS, PVNS, synovial xanthoma, synovial endothelioma, fibrous histiocytoma, giant cell fibrohaemangioma have been used to describe this entity. The age at presentation varies widely, with a mean age at presentation of 40 years, with no clear sex preference.

**Pathology:** GCTTS can be *localised* or *diffused* based on the growth pattern and clinical behaviour. The mononuclear component of these tumours is desmin-positive in about 50% of cases. Clusterin is also a highly sensitive marker for tenosynovial GCTs, which shows that the large mononuclear cells are derived from synoviocytes and support that these tumours are neoplasms. They are considered to be the most common true neoplasm of the hand and second most common tumour of the hand (after ganglia). **The localised type**, 80% seen in

hand, typically occurs in smaller joints (fingers, toes) and is characterized by hyperplastic villous synovium with a giant cell tumour component, and often prominent haemosiderin deposition. The tumours commonly manifest as a painless, palpable subcutaneous mass adherent to the extensor or flexor surface of tendons. **The diffused type** more often involves larger joints (knee, foot, thigh), but can also occur in the fingers and wrist. The diffuse type is locally aggressive and has a higher recurrence rate.

**Presentation:** Patients commonly present with a mildly symptomatic mass (pain, tingling, stiffness). Duration of symptoms can vary from months to years. Presentation is often delayed in painless lesions. Radiographs show swelling, soft tissue mass, and sometimes calcification, bony pressure erosion, and degenerative joint disease. The GCTs of the hand can appear similar to tophaceous gout or inflammatory tenosynovitis. Often clinical diagnosis must be confirmed by biopsy and culture of the aspirate.

**Treatment:** Complete surgical resection for cure is thought to decrease recurrence or curative. Biopsy is important to obtaining an accurate diagnosis. Recurrence is associated with certain features: anatomic location (distal interphalangeal joints of fingers or interphalangeal joint of the thumb), pressure erosion of bone on radiographs, associated degenerative joint disease and clinical subtype. Recurrence rates of 10% - 20% for the localised and 40% - 50% for the diffused type. Age, gender, lesion size, and volar versus dorsal location within the digit have no influence on recurrence rate. Surgical finding in the first patient: the lump is soft and brown in appearance around the flexor tendons inside the fibrous sheath (Figure.2a and 2b)). No capsule but can be dissected out. The ulnar digital nerve is compressed by the tumour causing her pain over the ulnar side. Proper excision minimizes recurrence.



## Q3. Granuloma of tendon sheath

Non-tuberculous granuloma of tendon sheath can occur in seamstresses, wood workers, gardeners or rubbish collectors due to needle, pinprick or wooden or glass splinters embedded in fingers mostly volar aspects. In Malaysia reports of granuloma developing from palm thorn splinters in estate workers is fairly common. On the other hand non-tuberculous mycobacterial infections are getting more widely known. They cause an array of cutaneous infections and occasionally systemic disease. The number of infections associated with these bacteria has been increasing in the last two decades.

The most common mycobacterium is the *M. marinum*. As the name suggests, *M. marinum* inhabits water and is found worldwide in oceans, beaches, lakes, rivers, ponds, wells, swimming pools, and home aquaria. Human infection was first described in swimmers with pool exposure, hence the name "swimming pool granuloma." After chlorination, the swimming pool link dissipated. Disease today primarily occurs in fishermen or in individuals with aquaria, hence the term "fish tank granuloma." *M. marinum* infection is usually contracted through an open wound or abrasion during submersion of an extremity into water (e.g., cleaning an aquarium. Occasionally several nodules or plaques develop. Commonly affected sites are the hands, elbows, and deep infections may cause tenosynovitis or bursitis

and can progress to septic arthritis or osteomyelitis. The infection usually has chronic course without pyrexia or general symptoms, raised blood count or ESR. The swelling is tender and warm to touch. The granuloma should be explored, debrided and excised materials sent for histological confirmation to exclude tuberculosis (Figure. 3).

**Diagnosis:** Tissue culture confirms the diagnosis. Histopathology usually reveals a granulomatous dermatitis with sparse evidence of acid-fast bacteria.

**Treatment:** This self-limiting disease may resolve in 12 to 24 months. It can be treated with clarithromycin as first-line antibiotic. For deep or extensive infections, ethambutol and rifampicin are preferred. Granulomatous tissue and collection of pus, if neglected may rupture the tendon causing mallet finger deformity. Proper drainage and debridement with antibiotic therapy is curative.



#### Q4. Tuberculosis of tendon sheath

Tuberculosis of hand occur secondary to generalised infection, commonly pulmonary. Compound palmar ganglion with typical rice-bodies fibrinous exudate is well known presentation. Tendon sheaths, carpal joints or small bones can also be affected. Tenosynovitis is a mildly painful chronic doughy swelling along the flexor tendon sheath and may affect finger movements. Occasionally swelling may increase, ulcerate and develop into a chronic pus discharging sinus, eventually destroying the tendon. Patient may have known PTB, a positive Mantoux test and high ESR. Kotwal et al. (2009) have recently presented a prospective series of 32 patients with tuberculosis of the hand and wrist. Twelve had bony disease and 20 soft-tissue involvement. Pain and swelling were the usual presenting features and discharging sinuses were seen in three cases. All patients received anti-TB chemotherapy with four drugs. Conservative treatment was successful in 24 patients (75%). Eight who did not respond to chemotherapy within eight weeks required surgery.

Although tuberculosis of hand has variable presentations, the majority of lesions respond well to conservative management. MRI showed extensive collection of granulation and pus within the flexor sheath (Figure.4). ESR was 110mm/Hg. Chest radiograph showed an active lesion at the upper lobe of left lungs. Patient was started on a six month course of anti-tuberculous treatment.



#### Q5. Lipomatosis of hand

Benign symmetrical multiple lipomas in hands alone is a rare condition. However in association with lipomas in other parts of the body this case may represent more common lipomatous deposits found in

- Madelung disease, characterized by diffuse, symmetric, painless, nonencapsulated, and irreversible growth of lipomas and often arranged symmetrically around the neck, shoulder and arms.
- Dercum's disease a rare disorder characterized by multiple painful subcutaneous lipomas on the trunk and extremities. It most commonly occurs in obese, postmenopausal women. The pain associated with this condition is postulated to arise from enlarging lipomas producing pressure on peripheral nerves, thereby initiating pain and sometimes paresthesias. Treatment has been a challenge due to the rarity of this condition. Application of transdermal lidocaine 5% patches has been helpful
- Adiposa dolcrosa is a disease characterized by painful, subcutaneous fatty tumors. This disorder usually occurs in obese, postmenopausal women and is associated with weakness and mental disturbances such as depression, confusion, lethargy, and dementia and may be hereditary. The cause is unknown, and there is no specific treatment. Pathologic findings are indistinguishable from common benign lipomas.

#### Q6. Gouty Tophi

Gout is a debilitating joint disease due to hyperuricaemia. It is frequently associated with consumption of purine-rich diet and excessive alcohol intake. The disease progresses through different stages especially in untreated patients. From a simple acute gouty arthritis, the disease can evolve to tophaceous gout which is characterized by the development of large deposits of monosodium urate crystals around the joints. The deposits can protrude through the skin and can more than likely erupt, sending yellowish liquid out to the epidermis. Gout tophi often mark the onset of a very severe case of painful disease. As gout and tophi continue to develop, the patient can be forced into immobility.

Management is mostly through uric acid lowering drugs. The classical well-trusted drug in chronic gout is Allopurinol, a structural isomer of hypoxanthine which inhibits xanthine oxidase. It therefore decreases both uric acid formation and purine synthesis. Two other drugs have been newly released in the market are Pegloticase and Febuxostat. Pegloticase is a recombinant porcine-like uricase. It metabolises uric acid to allantoin. This reduces the risk of precipitates, since allantoin is five to ten times more soluble than uric acid. Its half life is ten to twelve days allowing a dose every 2 to 4 weeks making this drug more patient-compliant.

Febuxostat is an inhibitor of xanthine oxidase. It is indicated in the treatment of hyperuricemia and gout in patients at-risk for Steven-Johnson syndrome.

**Summary of hand swellings:** It is important to maintain a broad differential for masses in the hand. Acute hand infections include felon, paronychia, deep-space infections, septic arthritis, osteomyelitis, and necrotizing fasciitis. Chronic infections are usually caused by atypical mycobacteria and fungi, GCT, benign neoplasms such as glomus tumors, chondromas, nerve sheath tumors, gouty tophi, and tuberculous osteitis, ganglion and lipoma. Hand infections must be properly diagnosed and treated to minimize the potentially devastating functional complications.