The Limbs

The Hand Infections

In upper limb, hand infections are of great surgical significance, especially when it is realized that because of its functional importance, 'Hand should be considered as a vital organ'.

In addition to severe throbbing pain and limitation of function, hand infections may leave permanent deformities which may cripple patients for life, and affect their survival capabilities. Anatomically hand has many closed and compact spaces like pulp spaces, palmer spaces, synovial sheaths, etc., where even a small collection of few drops of blood, pus or even oedema fluid can cause severe throbbing pain. It can do considerable damage by compromising the vascularity, leading to necrosis of tendons and crippling their function.

Infections which are localized and can be spot diagnosis are pulp space infection [Felon], nail bed and nail fold infection [Paronychia]. Generalised spreading cellulitis may involve entire hand.

Acute infection in synovial sheath is called Tenosynovitis, causes swelling of the whole finger, making it difficult to move without pain. In thumb and little finger synovial sheath extends proximally and is connected to common synovial sheath for all tendons, called 'Ulner bursa', situated in Parona's space in front of the wrist. Tenosynovitis of thumb and little finger therefore extends proximally into forearm, unlike other three fingers which remain confined to fingers only. Kanavel's sign, maximum tenderness medially between transverse creases of hand helps in diagnosis.

Treatment is by exposing the involved tendon sheath, cleaning and irrigating it, and encouraging early movements.

Infections in palm may be in Superficial palmer spaces, and in Thenar and Hypothenar spaces which are easy to diagnose. However, those in Deep Palmer Sspace, are difficult to diagnose since tense palmer fascia prevents swelling to appear in palm. Oedema therefore affects back of hand, even though collection is in anterior compartments. It is important to localize the collection for direct incision and drainage, which is the treatment of choice. In all cases, elevation of hand reduces the oedema and pain, facilitating early movements which are essential to regain full function. Prolonged oedema, delay in treatment and failure to mobilize the hand early may cause permanent limitations of full range of movements.

Ganglion

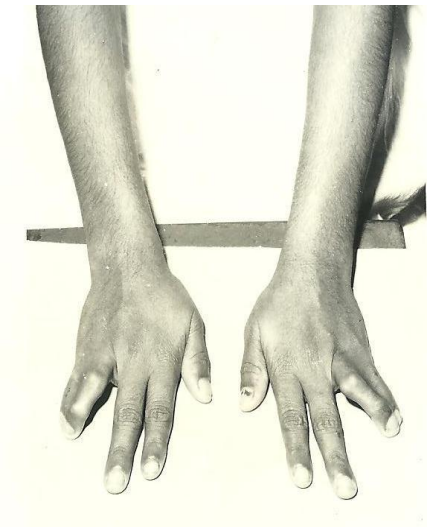
It is a degenerative conditions caused by repeated friction of tendon in tendon sheath. It lies along the tendon sheath and is connected to it. It contains jelly like thick synovial secretions. It is firm in consistency and can be moved across the tendon. Small ones can be left alone. Large or painful ones need complete excision. Recurrence is common.

Dupuytren's Contracture

This has genetic basis, but also occurs in conditions of severe liver failure.

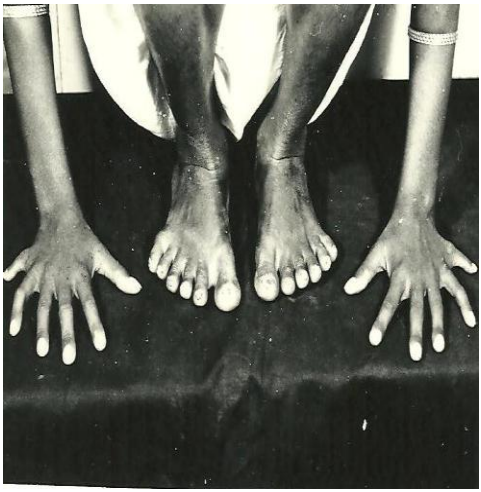
Polydactyly [extra fingers] are congenital disorders. Syndactyly [fused fingers] can be congenital or acquired. Acquired deformities of hand usually are due to scaring after burns, trauma or infections.

Dupuytren's contracture



Syndactyly, fused fingers

Polydactyly, extra finger and extra thumb



Polydactyly, six fingers in each hand and six toes in each foot

Babies may be born with congenital deformities of hands and feet

The Foot

Diabetic Foot

The single most important entity of surgical importance in feet is what is called 'Diabetic foot'. Surgically it means a foot with closed or open lesions in a diabetic patient. Lesions depend on three most important pathological processes involved; Ischaemia, neuropathy and infection. Proportion of first two may vary, but infection is invariably present in all the lesions.

Closed lesions are cellulitis, abscesses, osteomyelitis and Charcots' joints.

Open lesions are vascular ulcers on toes, neuropathic ulcers on pressure points, discharging sinuses, and moist infective gangrene.

It is patient's inability to appreciate, even minor trauma, due to absence of pain, which leads to ulcers. Inability of ulcers to heal is due to continued trauma, infection, pus and necrotic tissue which act as foreign materials; and patient's

poor immune response towards healing. This perpetuates the problem till, one by one tissues die and frank gangrene sets in. Patients eventually lose their toes, feet, and even legs, by way of inevitable amputations.

Diagnosis is evident. Classical signs of inflammation may be absent due to lack of immune response, even in presence of serious infections.

Crepitus on pressure suggests gases inside, due to anaerobic putrefaction of dead tissue. X-ray of foot will confirm presence of gases as well as presence of ostomyelitis; and disorganized foot due to autonomic neuropathy of small joints [Charcot's joints].

Examination of peripheral pulses, dorsalis paedis, posterior tibial, popliteal and femoral, is mandatory. Presence of palpable pulses does not rule out ischaemia, which may be due to micro-angiopathy.

Sensations like pain, position and vibration are lost early in diabetics and should be checked.

Any discharge, usually foul smelling due to anaerobes, should be examined for organisms, which invariably are a mix of gram positive and negative aerobes, and anaerobes.

Principles of treatment are basic; control the diabetes, control the infection, drain the collection, deslough and debride the dead tissue, as far as possible be conservative, preserve what can be saved; and remove [amputate] what is already dead and cannot be saved. Newer techniques to promote healing like vacuum dressings can be helpful. Vascular assessment of the limb is necessary to deal with PVD.

When ulcers heal and foot returns to normal, prophylactic measures should be explained to the patient to prevent recurrences. Amputated patients require

rehabilitation.

Other conditions of surgical interest in feet are spot diagnosis. Most of them are caused by the habit of wearing tight fitting shoes.

Diabetic foot Charcot's joints in a diabetic patient

Other Lesions of Foot

Hallux valgus is an acquired deformity of big toe due to tight fitting shoes, common in females. Due to continuous irritation, a bunion develops on the medial side of the head of first metatarsal. It is an adventitious bursa covered by thick skin.

Ingrowing toenail affects the big toe on one side or both, and can be bilateral. Infection invariably sets in making them extremely painful. Good hygiene can avoid this complication. In recurring cases, partial excision of nail with nail bed can be curative.

Peripheral Vascular Disorders [PVD]

Malformations

Peripheral Vascular Disorders can involve arteries, veins or both.

Vascular malformations may be congenital or acquired in the form of haemangiomas, aneurysms and arterio-venous fistula.

Trauma is the common cause of acquired AV fistula.

Swelling with pulsations and machinery murmur are diagnostic. Duplex sosnography and angiography can confirm configuration of vessels.

Following pictures show traumatic AV malformations in the hand.

Arterial Disorders

Arterial diseases lead to ischaemia, which may be acute or chronic, and spastic or occlusive in nature.

Causes of acute ischaemia include trauma, external compression as with tourniquet, emboli from cardiac valvular lesions or arterial aneurysms, or sudden vasospasm.

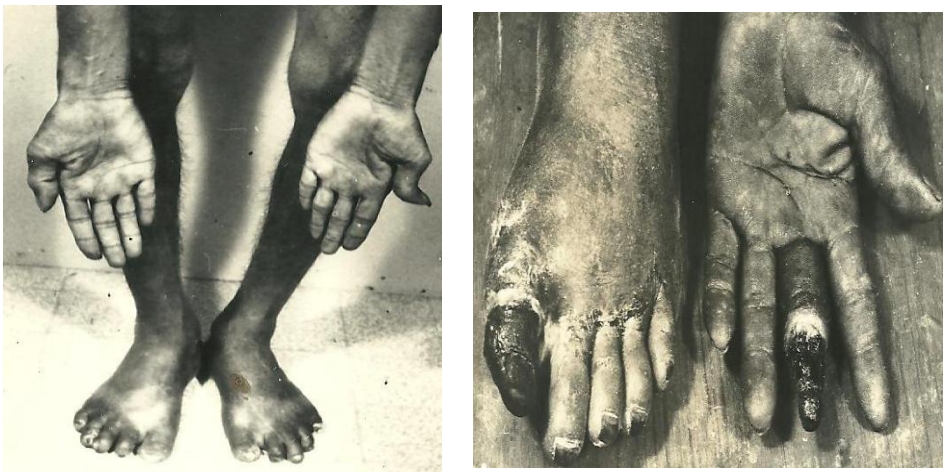
Acute ischaemia is defined as sudden severe pain and swelling of distal part of the limb of less than two weeks in duration. It leads to necrosis of tissues and wet gangrene.

In vasospasm, small arteries and arterioles go into spasm in response to extreme cold, sympathetic over activity or drugs like ergotamine. Raynaud's phenomenon and Raynaud's disease in fingers of hand is an example. Eventually it leads to gangrene of fingers.

Gangrene of fingers in Raynaud's disease

Chronic ischaemia is defined as vascular symptoms for more than two weeks. It is due to either inflammatory vascular condition or atherosclerotic occlusive vascular disease and commonly affects the lower limbs. Risk factors are age, smoking, hyperlipidaemia and diabetes.

Thrombo-angitis obliterans [Buerger's disease] is progressive panvasculitis that affects lower limbs of heavy smokers, even at young age. Systemic lupus erythomatus [SLE] is another cause of vasculitis and vascular occlusions.



Buerger's disease, dry gangrene of fingers and toes

Main symptom of peripheral vascular insufficiency is pain. Cuteneous ischaemia causes severe burning pain and ulcerations in toes, and eventually leads to dry gangrene. Muscular ishaemia causes intermittent claudication which is pain in calf muscles on walking and exercise. As disease progresses, it may turn into rest pain.

Vascular assessment of lower limb includes clinical examinations for dysplastic changes in limb such as dry and shining skin, loss of hair on limbs, brittle nails, empty or guttering of veins, and diminished or absence arterial pulses.

Classical symptoms and signs of ischaemia are SIX 'P's. They are Pain, Pallor, Paralysis, paraesthesia, Pulseless, and Persisting coldness.

Essential investigations include ankle/brachial index, duplex sonography and

CT angiography.

Critical ischaemia is diagnosed when there is rest pain for more than two weeks, ankle pressure is less than 50 mmHg and threatened or frank gangrene is present. This decides the urgency of surgical interference and the choice of procedure.

Non critical ischaemia is diagnosed when there is mild to moderate claudication, and ankle pressure is more than 50 mmhg. Revascularisation procedures are indicated in such cases.

Endo-vascular procedures are gaining popularity due to their convenience and success rate. Revascularization is always the first choice for ischaemia; amputation always the last.

Necrosis of tissues is invariably confused with gangrene and it is essential to differentiate between them. I have known student calling any black patch on toes as gangrene, although the toe is very much alive and moving.

Necrosis is death of one or more tissues. This requires mere debridement; just the removal of dead tissue, never amputation. Examples of necrosis are black patches on skin, dead bone [sequestrum], dead muscle or tendon, etc.

Gangrene is en mass death of ALL tissues superadded with putrefaction. Gangrene requires amputation, the last option in management. In gangrenous part all signs of life are absent, That is: No circulation [Pulseless, black and cold], No sensations, and No function.

Gangrenes are of three types. In dry gangrene part is shriveled, black, cold, pulseless, senseless and no movements. Dead part is separated from living by a 'Line of demarcation'. It is caused by inflammatory reaction of living tissue in response to dead tissue, which is considered as a foreign body. Dry gangrenes

develop slowly giving enough time for blood to drain through veins; thus shriveling the part, as typically happens in atherosclerotic gangrenes. Dry gangrene requires planned amputation at the line of demarcation. In moist gangrene, on the other hand, the part is swollen because of sudden nature of obstruction as in embolism, infective gangrenes, and traumatic gangrenes. Gangrenous part is pulseless, cold and blotchy in color. Initially it is extremely painful due to dying nerves and movements, if any, are painful. Antibiotics may help localize the actual dead part, thus deciding the level of amputation. Embolectomy, open or by Fogrty's catheter, can salvage the limb.

Gas gangrene is the most severe type of gangrene, caused by clostridium group of organisms. Part is swollen, crepitus is present on palpation, foul smelling fluid may be oozing. There is severe systemic reaction due to circulating endotoxins, which is the cause of fatality. X-ray shows presence of gas in various layers.

However mere presence of gas, as happens in diabetic foot, is not gas gangrene, since there are no circulating toxins.

Emergency amputation, even of guillotine type, can be life saving in gas gangrene. Antitoxins or human gamma globulins help antagonize the toxins.

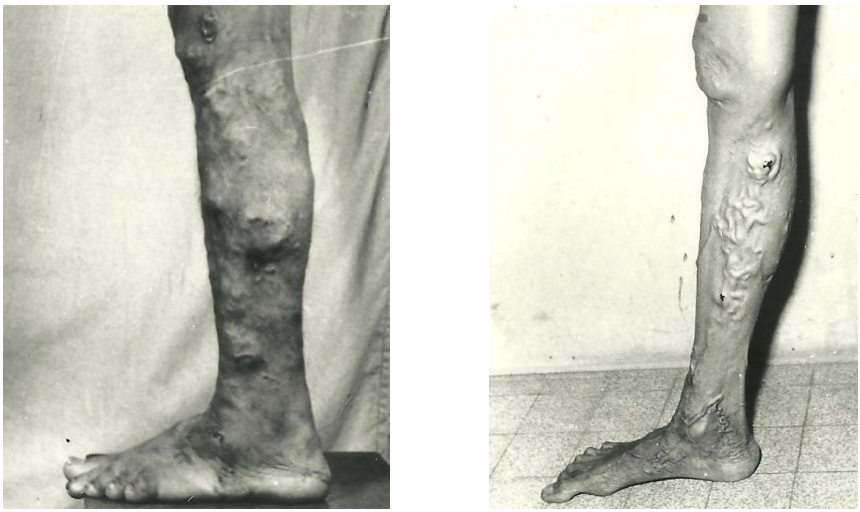
Disorders of Veins

Lower limbs are more prone to venous disorders because of antigravity flow of blood.

Venous system in lower limb is divided in two groups; superficial and deep. Both systems have one way valves at intervals, up to groin. In addition, there are communications between the two systems called 'Perforators', since they pass through deep fascia. They also have valves to allow one way flow of blood;

from superficial to deep.

Superficial veins have two systems. Long saphenous vein runs on medial side from ankle to sapheno-femoral junction, where it joins the femoral vein and where the last valve is situated. Short saphenous system runs on lateral side till popliteal fossa where it joins the popliteal vein. Both systems can become dilated, elongated and tortuous, called varicose veins, in response to prolonged standing or incompetence of valve systems, in vertical long veins or horizontal perforators.



Varicose veins of short [left] and long [right] saphenous venous systems

Trendelenberg test can confirm the incompetence of sapheno-femoral valve. Leg is raised to empty the veins, sapheno-femoral junction which lies one cm. below the mid-inguinal point in femoral triangle, is blocked by thumb or a tourniquet, and the leg is lowered. If veins fill up, incompetence is of intercommunicating valves. If not, the thumb or tourniquet is removed. Sudden filling of veins from above confirms incompetence of sapheno-femoral valve. Level of incompetence of intercommunicating valves can be confirmed by three tourniquet test.

A group of veins may be varicose in upper thigh called saphenous varix.

Other than cosmetic appearance, main symptoms of varicose veins are swelling of feet and heaviness of leg, especially in the evening or after long standing. Putting up feet while resting, and use of elastic stockings while standing and walking, can relieve the symptoms. Current trend in treatment is endoscopic laser or elctro-coagulation which clots the blood and destroys the endothelium. Communicating veins can also be clipped by endovascular surgery. Foam is being used to replace sclerotherapy. These have replaced the classical treatment by surgical ligation and stripping of varicose veins.

These veins may have great use in coronary artery surgery; hence damaging them should be considered with great caution.

Unsightly venous flares or stars on relatively white thighs and legs can be treated by local injections of sclerosing agents with compression.

Complications of varicose veins include inflammations, ulcerations, thrombosis, and haemorrhage.

Superficial veins may be the site of thrombophlebitis, especially after needle insertions. It presents with painful swelling at injection sites and thrombosed veins may feel like cords. Local application of decongestant ointment gives relief.

Spontaneous recurrent migrating thrombophlebitis is an ominous sign and can be the superficial manifestation of deep seated malignancy like pancreatic cancer.

Long saphenous vein is subcutaneous at ankle and is therefore prone to trauma, ulcerations and haemorrhage.

Stasis of deoxygenated venous blood in long saphenous vein above medial maleolous at ankle leads to breakdown of skin and ulceration. These are called venous ulcers, stasis ulcers or indolent ulcers. They are chronic and very difficult to treat, and can be recurrent if varicose veins are not treated simultaneously.

Malignant change in such a chronic ulcer can lead to a variety of squamous cell carcinoma called 'Marjolin's ulcer'. This is locally malignant and sclerosis around prevents lymphatic spread. Biopsy from edge of the ulcer can confirm the diagnosis. Wide local excision with skin grafting may be required.

Haemorrhage can be very severe, specially from long saphenous vein, since all the valves above ankle including sapheno-femoral valve may be incompetent, and blood may be draining down all the way from femoral and iliac veins due to gravity. Elevating the leg and direct or proximal pressure is the best first aid treatment.

Deep vein thrombosis can be a complication of varicose veins; however spontaneous thrombosis [DVT] is much more common. Prolonged stasis of blood in veins and thrombotic tendencies lead to this condition. Predisposing factors include trauma, obesity, pregnancy, prolonged immobilization, thrombocytosis, and contraceptive drugs.

Clinical presentation is with oedema of foot and painful swelling of calf. Squeezing of calf muscles and dorsiflexion of foot causes pain, called Homan's sign. This procedure may dislodge any fresh thrombus and lead to Pulmomary Embolism, a deadly complication of DVT; caution is advised.

Treatment is by anticoagulation and compression stockings. In high risk group prophylactic heparinisation is indicated, especially before surgery.

Complications of DVT include painful oedema and chronic ulcerations of the foot and ankle [Post phlebitis syndrome], and even venous gangrene.

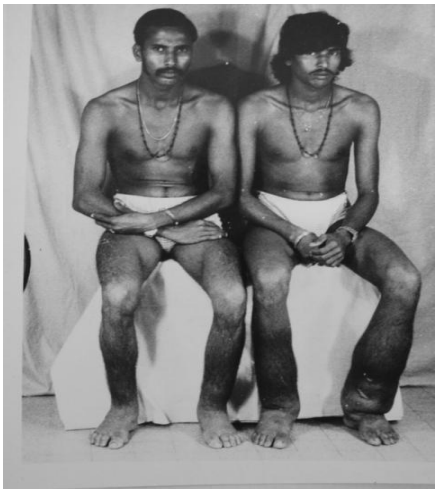
Venous ulcers above ankles

Venous gangrene of foot

Bilateral swelling of lower limbs may be pitting oedema, a part of generalized fluid retentions in systemic disorders. It may also be due to pressure on venous drainage in pelvis, or due to lymphatic obstructions; in this case it may be pitting or non-pitting solid oedema.

Unilateral swelling of lower limb is either of venous or lymphatic obstructions in pelvis or groin.

Lymphoedema can cause unilateral or bilateral swellings of lower limbs. It is pitting to start with, but becomes solid and non-pitting due to fibrosis in response to lymph oozing in tissues. Lymphoedema precox occurs in young age; lymphoedema tarda, in elderly. Females are more prone than males. Bilateral lymphadema is also a congenital and familial disorder called Milroy's disease.



Milroy's disease [familial lyphoedema]

Congenital unilateral lymphoedema

Filariasis is the common cause of lymphangitis and acquired lymphoedema. It can extend to scrotum and female genitalia also.

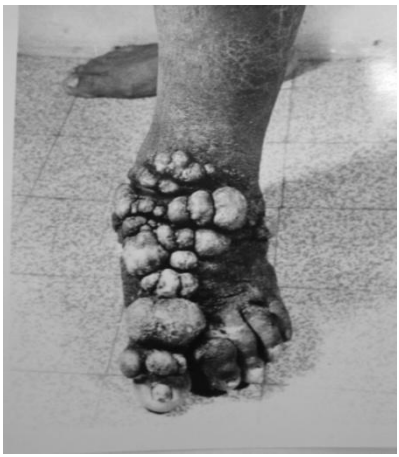
It leads to hypertrophy of the foot and leg due to chronic irritation; a condition called 'Elephantiasis' and 'Gigantism'.

Diagnosis of filariasis in endemic areas is by demonstrating the larvae of parasite in blood during acute febrile stage. Diuretics and compression stockings help in pitting stage.

Lymphoedema can also occur in neoplastic involvement of lymph nodes, or after their removal by surgery, as after radical mastectomy.

Solid oedema does not respond to any treatment. Surgical procedures are available but give unsatisfactory results.

Fungal infestations like actinomycosis and other micotic organisms can also cause swelling of foot, called Mycetomas or 'Madura foot'.



Fungal, mycotic lesions of foot

Elephantiasis, filarial lesions of lower limbs

Surgery in Tropics

Tropical regions of the world have very distinct and specific eco-system and environment. The weather is hot and humid; and monsoon or rainy season is an integral part of the system. This combination of heat and moisture generates very different fauna and flora. The atmosphere is swarming with all types of flying and crawling insects, many of these act as agents for transmitting diseases. They act as vectors or hosts, either definitive or intermediate hosts for parasites which are abundant in tropical climate.

Most of the countries situated in tropical belt of the planet earth are relatively under-developed economically and are very thickly populated. This overcrowding brings its own consequences in terms of diseases. Moreover the economic disparity keeping a large percentage of population below poverty line naturally impacts on sanitary and hygienic conditions, which, invariably are of the most primitive nature. This provides natural environment for the spread of communicable diseases. The food and drinks including water are usually polluted resulting in frequent episodes of gastrointestinal problems in population.

Poor hygiene and sanitary conditions combined with abundant abnormal or unhealthy sexual habits results in all forms of venereal diseases including the HIV. At times, combination of more than one factors exponentially multiply the epidemiology of tropical diseases. Many of these tropical conditions have surgical manifestations.

It is important that all those who live, visit or practice surgery in tropical countries familiarize themselves with all aspects of ‘Tropical Surgery’.

This is the objective of this chapter.

Parasitic Diseases

Amoebiasis

Caused by: Entamoeba Histolitica. Found in Cystic and vegetative forms.

Lesions: Dysentery, Colitis, Liver abscesses, Amoeboma, Perianal fistulae.

Clinical picture: Blood in stool, Tender iliac fossae, RIF mass, enlarged tender liver, perineal discharging sinuses.

Important tests: Stool for blood, amoebae, vegetative forms or cysts. Serology for anti amoebic antibodies.

Surgical complications: Peritonitis, Intestinal obstruction, Empyema, Lung abscesses.

Treatment: Anti-amoebic drugs. Image guided aspiration/drainage of abscesses.

Classical appearance of pus 'Anchovy sauce'; pus mixed with blood.

Bilharziasis [Scistosomiasis]

Caused by: S. Haematobium, S. Mansoni, S. Japonicum.

Lesions: Urogenital and colonic ulcerations, granulomas and polyps.

Liver fibrosis and portal hypertension.

Clinical picture: Haematuria, dysentery, rectal ulcers and polyps, splenomegaly, Haemetemesis.

Important tests: Urine and Stools for ova, Rectal snip biopsy, Liver biosy, Upper GI endoscopy.

Surgical complications: Intestinal obstruction, Ureteric strictures, Bladder cancer. Bleeding upper GI varices, Portal hypertension.

Treatment: Anti-bilharzial medications. Banding or scleotherapy for bleeding varices.

Filariasis

Caused by: Wuchereria bancrofti.

Leisions: Subcuteneous sclerosis, Iliac adenitis, Funiculitis, Lymphoceles.

Clinical picture: Elephantiasis of lower limbs and external genitalia. Very thick skin and subcutaneous nodules.

Important tests: Peripheral blood film for microfilaria. Skin snips, Lymph node aspiration, biopsy of nodes.

Surgical complications: Secondary hydrocele, Disfigurement and disability.

Treatment: Anti-filarial drugs.

Filarial lesions of right leg and foot

Malaria

Caused by: Plasmodia species

Lesions: Splenomegaly. Acute abdomen. Meningo-enchephalitis.

Clinical picture: Periodic High fever with rigors. Signs of Acute abdomen.

Important tests: Blood film for parasites, during pyrexial attack.

Surgical complications: Acute abdomen. Rupture of spleen.

Treatment: Anti-malarial drugs. Slenectomy.

Chaga's Disease

Caused by: Trypnosoma cruzi.

Lesions: Cardio-spasm, mega-oesophagus. Mega-colon. Cerebral lesions.

Clinical picture: Fever, lymphadenitis, painful skin nodules, dysphagia, constipation.

Important tests: Blood, bone marrow for parasite. Lymph node aspiration. Barium swallow and enema.

Surgical complications: Cardio-oesophageal and Intestinal obstruction.

Treatment: Anti-tryposomial drugs. Dilatation of cardia.

Intestinal Helminthes, Ascariasis.

Caused by: Ascariasis lumbricoides.

Lesions: Anaemia. Intestinal obstruction. Obstructive jaundice.

Clinical picture: Colicky abdominal pain, vomiting including worms, abdominal distension, shifting soft abdominal mass.

Important tests: Stool for ova, abdominal x-ray; plain and with barium.

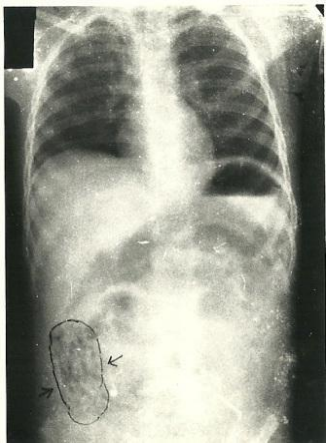
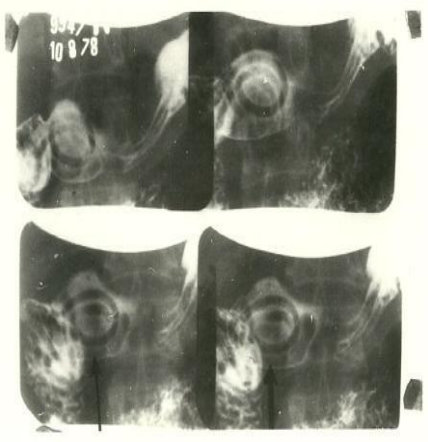
Surgical complications: Intestinal obstruction, perforation, peritonitis. Jaundice. Anaemia.

Treatment: Anti-helminthic drugs.

Following pictures show complications of round worms, obstructions and intestinal gangrene. X-rays show round worms in intestines.





Guinea Worm Infestation

Caused by: Dracunculous medinenses.

Lesions: Cellulitis, subcutaneous abscesses, Arthritis. Spinal abscesses.

Clinical picture: Acute ulcers, discharging sinuses extruding thread like worm. Cold abscesses. Arthrosis. Paraplegia.

Important tests: Blood for eosinophilia, X-rays, myelogram.

Surgical complications: Blisters. Spreading cellulitis. Paraplegia.

Treatment: De-roofing the blisters and removing entire parasite.

Anti-parasitic drugs.

Hydatid Disdease

Caused by: Ecchinococcus granulosus.

Lesions: Hydatid cysts in liver, lungs, and in any other organ/tissue.

Clinical picture: Hepatomegaly. Palpable masses. Vomiting/Spitting 'Grape skin'.

Important tests: Casoni's intradermal test, serological [ELIZA] tests for antibodies. CT scans.

Surgical complications: Secondary infections. Rupture of the cysts in abdomen, pleura, lungs and pericardium. Abdominal hydatidosis.

Treatment: Anti-parasitic drugs [Albandazole], guided aspiration of cysts followed by injection of scolicidal solutions, surgical de-roofing, marsupialisation or excision where possible.

Bacterial and Viral Diseases

Tuberculosis

Caused by: Mycobacterium tuberculosis.

Lesions: Lymphadenopathy and cold abscesses. Abdominal tuberculosis.

Pulmonary and pleural lesions. Urogenital tuberculosis. Tubercular osteomylitis and arthritis. TB meningitis.

Cuteneous tuberculosis [Scrofula].

Clinical picture: Mild fever in evenings, night sweats, general malaise.

Matted swellings in neck, axilla, groin. Discharging sinuses, Painless haematuria, Bony deformities, Intestinal obstructions, Cough and Haemoptysis.

'Cold abscesses'.

Important investigations: Tuberculin test, AFB bacteriology, smear, staining, cultures, X-rays, endoscopy, Biopsy.

Treatment: Anti-tubercular chemotherapy.

Drainage of collections. Excision of lesions/masses.

Prophylaxis: BCG inoculation.

Cold abscesses following BCG inocculations

Tubercular lesions in neck, axilla and arm, tubercular ulcers and sinuses

TB of buccal lymph node in cheek Tubercular inguinal ulcers

Leprosy [Hansen's Disease]

Caused by: Mycobacterium Laprae.

Lesions: Lepromatous and tuberculoid forms. Nodules and Ulcers.

Clinical picture: White Patches of anaesthesia. Subcuteneous nodules. Thickened peripheral nerves. Deformities of face and limbs.

Important investigations: Nasal mucosa scrapings. Biopsy of de-pigmented and anaesthetic patches. Demonstration of Micobacterium.

Complications: Trophic ulcers. Loss of digits. Deformities and disfigurement.

Treatment: Anti leprotic drugs.

Syphilis

Caused by: Spirochetes.

Lesions: Stage I Primary chancres.

Stage II Muco-cuteneous ulcerations.

Stage III Granulomatous Gammas.

Stage IV Neurosyphilis. Tabes dorsalis and demyelinations.

Clinical picture: Painless genital ulcers with punched out edges Painful muco-cuteneous ulcers. Hepatic and testicular masses. Sensory neuropathy.

Important investigations: Demonstration of spirochetes from acute ulcerative lesions. Serology tests. Biopsy.

Treatment: Antibiotics. Penicillin preferred.

Peri oral menifestations of secondary syphilis

Loss of toes and deformity of foot in leprosy

Typhoid

Caused by: Salmonella Typhi and Paratyphi.

Lesions: Intestinal ulcers, Splenomegaly.

Clinical picture: Prolonged high fever. Acute abdomen, Perforation and Peritonitis.

Important investigations: CBC [leucopaenia], Serology, Blood culture, X-ray abdomen, endoscopy.

Treatment: Antibiotics, Explorations.

Granuloma Inguinale [Venerum]

Caused by: Donovan bodies.

Lesions: Painless masses in groin, genitalia and perineum. NO lymph node involvement.

Important investigations: smear examination for Donovan bodies.

Treatment: Antibiotis. Excision of remaining mass.

Non Specific Tropical Ulcers

Caused by: Vincents organisms [spirochetes].

Lesions: Chronic non healing recurrent lower limb ulcers.

Important investigations: Exudate Culture, Biopsy, x-rays.

Treatment: Antibiotics.

Tropical Pyo-Myositis

Caused by: Staph. Pyogenes.

Lesions: Multiple muscle abscesses, Deformities.

Clinical picture: Immuno-compromised patients.

Important investigations: Pus culture. Scanning, Biopsy.

Treatment: Antibiotics. Drainage.

Cancrum Oris

Caused by: Vincents organisms. Aerobes and anaerobes.

Lesions: Symbiotic gangrene around oral cavity and cheek. Osteomylitis of jaw.

Important Investigations: Bacteriology.

Treatment: Antibiotics.

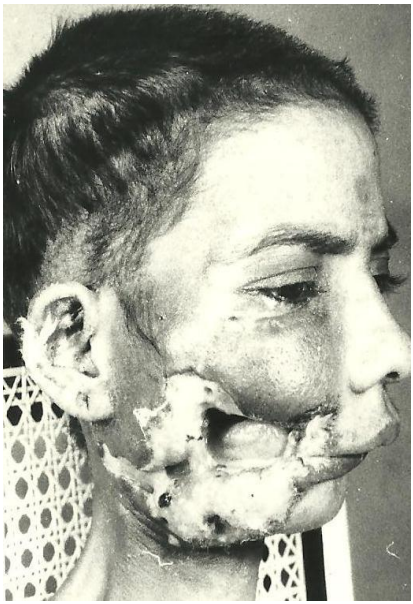
Fournier's Gangrene

Caused by: H. Streptococcus and anaerobes.

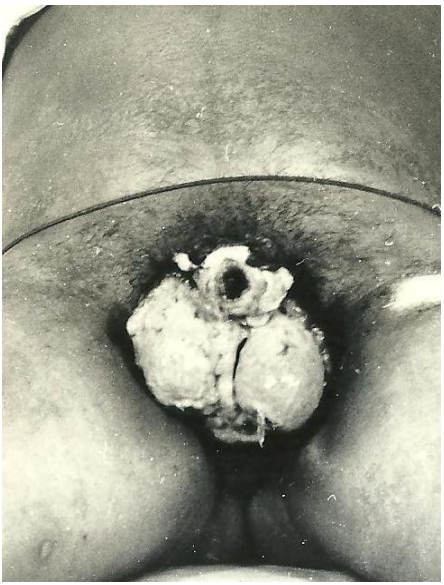
Lesions: Spreading Gangrene of Scrotum and external genitalia. Testes are spared.

Important investigations: Culture of exudates.

Treatment: Antibiotics. Excision of necrotic tissue.



Cancum oris



Fournier's gangrene

Lymphogranuloma Inguinale [Venerum]

Caused by: Viruses.

Lesions: Inguinal bubo. Genital ulcers.

Important investigations: Biopsy.

Treatment: Self limiting. Good hygiene.

HIV Infections

Although this condition has no specific surgical lesions, every surgeon, specially those in tropics, where its incidence is very high, must know about it.

The disease is highly infectious through body fluids, but simply direct touch or contact does not transmit the disease. Surgeons operating on patients positive for HIV have to take extra precautions against themselves acquiring this deadly

infection.

Moreover HIV patients are extremely immune-compromised which affects the outcome of surgical procedures. This requires extra care and attention.

Fungal Infections

Caused by: Actinomycosis and other mixed mycotic fungi. Common in farmers, villagers and bare foot walking people.

Lesions: Cervico-facial, abdominal and lower limbs. Osteomylitis.

Clinical picture: painless swellings and abscesses. Discharging sinuses elephantiasis. 'Madura foot.

Important investigations: demonstrating 'Sulfur granules' or myeciliam fungus in discharge. Culture growing fungi.

Treatment: antibiotics. Local excisions.

Mycotic lesions of foot, 'Madura foot'

Neoplasms

Following tumors still have increased incidence in tropics, although it is on the decline:

1. Facial cancers due to exposure to intense sunlight and Ultra violet rays;
2. Oro pharyngeal cancers due to chewing habits and poor oral hygiene;
3. Burkitt's lymphoma, Nasopharyngeal carcinoma. Viruses are implicated;
4. Primary liver cell carcinoma, Nutrition and viral infections are implicated;
5. Kaposi sarcoma;
6. Genital cancers, cervical cancer in females and penile cancers in males are due to poverty and poor hygiene;
7. Stagnant smegma in uncircumcised males is implicated in penile cancers.

Cases of Penile cancer

Blood Diseases

Sickle cell disease; Mediterranean fever.

Caused by: netic and hereditary factors.

Clinical picture: aemia, Haemolytic jaundice, Hepato-splenomegaly, Ascites.

Sickle cell crises, Acute abdomen, Gall stones. plenic infarcts. Joint pains, Haematuria.

Important tests: ckling test. Hb and foetal Hb. Serum Electrophoresis.

Treatment: ood transfusions. Hydration. Splenectomy.

Causes of 'Acute abdomen' in Tropics.

Always consider the following:

- Sickle cell crisis
- Acute Intestinal obstruction due to Intussusceptions, Volvulous, Ascariasis
- Perforation of ileal ulcers in typhoid, with peritonitis
- Amoebic colitis and amoebic liver abscesses
- Ruptured hydatid cysts
- Asiatic Colangitis
- Tubercular peritonitis.
- Tropical pyo-myositis.

- Malaria and spontaneous rupture of massive enlarged spleen

Useful Hints for Diagnosis [Easy to Remember]

It has been my experience that students may know all possible diagnoses of the condition; however, many times the most unlikely condition is their first answer.

Remember: Common things are common.

Most likely diagnosis should always be the first to be confirmed or excluded before other possibilities are considered. It should be on the top of the list of probable diagnoses.

Examples of most likely conditions, based on symptoms and signs, are summarized here.

Pain

1. 'Colicky pain' is due to intermittent spasms of smooth muscles in 'Tubes' of abdomen, and indicates distal obstruction.
2. Anatomical site of colic indicates probable condition.
   - 'Intestinal colic', in intestinal obstructions is in the center of abdomen.
   - 'Biliary colic' in biliary obstruction, is in right upper abdomen.
   - 'Renal/Ureteric colic' in proximal urinary obstruction, is in loin.
3. 'Dull continuous aching pain' is due to sudden stretching of capsules/ coverings of 'Solid organs'.

- Right hypochondrial pain as in ‘Hepatitis’.
- Lumber pain as in ‘Nephritis’.
- Epigastric pain as in ‘Pancreatitis’.

4. ‘Stabbing pain’ arises from deep seated organs. As in acute pancreatitis and dissecting aortic aneurysm.
5. ‘Burning pain’ is due to mucosal irritation or cuteneous ischaemia.
    - In mouth and throat as in stomatitis and pharyngytis.
    - Retrosternal as in gastro-oesophageal reflux.
    - Epigastric as in gastritis.
    - Suprapubic as in cystitis.
    - In urethra as in urethritis.
    - In toes in Buerger’s disease.
6. ‘Throbbing pain’ is due to collection of pus in deep seated closed spaces, such as in palmer abscesses, parotid abscesses, peri-anal abscess, etc.
7. ‘Constricting/ cramping pain’ is due to ischaemia of muscles.
    - In chest as in myocardial infarction. [cardiac muscle]
    - In abdomen as in mesenteric ishchaemia. [Smooth muscle]
    - In lower limbs as in intermittent claudication. [Skeletal muscle]

Vomiting

1. 'Projectile vomiting' suggests distal obstruction and proximal hyperperistalsis.
2. 'Effortless vomiting' suggests absence of peristalsis and passive regurgitation.

Definitions

Words ending with	Diagnosis	Example
1. -itis	Inflammation	Appendicitis
2. -oma	Tumors [Except hematoma]	Carcinoma
3. -otomy	Open and close	Colotomy
4. -ostomy	Leave it open	Colostomy
5. -ectomy	Remove	Appendectomy
6. -rrhage/rrhea/rrhagia	Flow	Haemmorrhage/ Rhinorrhea/ Menorrhagia
7. -pathy	Pathological lesions	Myopathy, Lymphadenopathy Retinopathy, Neuropathy
8. -megaly	Enlargement	Hepatomegaly Splenomegaly Cardiomegaly
9. -ocele	Fluid collection	Varicocele, Cystocele Meningocele, Hydrocele

Subcutaneous Swellings

Findings	Most Likely Diagnosis
i. Firm, attached to skin by punctum	Sebaceous cyst
ii. Soft, mobile, margins slip under the finger	Lipoma
iii. Soft, blue, compressible	Haemangioma
iv. Firm, mobile	Fibroma
v. Firm, painful	Neuroma
vi. Soft/firm, tender	Abscess
vii. Soft, pulsatile, expansile	Aneurysm

Wounds/Ulcers

i. Clean, sloping edge, pink, uniform, velvety granulation tissue on floor, sero-sanguinous discharge	Healing ulcer
ii. Dirty, indurated white punched out edges, Slough on floor, smelling purulent discharge	Non-healing ulcer
iii. Dirty, undermined edge, pale smooth floor, thin watery discharge	Tubercular ulcer
iv. Proliferating raised edges, vascular, bleeding, progressive growth	Malignant ulcer

Congenital Swellings

Findings	Most Likely Diagnosis
i. Pigmented compressible swelling	Haemangioma
ii. Transilluminant swelling in neck/axilla	Cystic Hygroma
iii. Reducible swelling in inguinal/umbilical region	Hernia
iv. Midline cystic swelling in neck	Dermoid cyst
v. Lateral cystic swelling in neck	Branchial cyst
vi. Cystic swelling in lumbo-sacral area	Meningocele

Traumatic Swellings

Haematoma/ fracture/ dislocation

Inflammatory Swellings

i. Fluctuant swelling with throbbing pain	Abscess
ii. Painless fluctuant swelling	Cold abscess

Cervico-Facial Swellings Most Likely Diagnosis

1. Anterior triangle swelling
    - Moving with deglutition Goiter
    - Moving with tongue protrusion Thyroglossal cyst
    - Not moving with either of the above Lymph nodes
2. Sub-mandibular swelling
    - Bimanually palpable sub-Salivary gland
    - Bimanually NOT palpable Lymph node
3. Parotid swelling
    - Painful Parotitis/abscess
    - Painless Tumor
    - With facial palsy Malignant tumor
4. Posterior triangle swelling Lymph node

Breast Swellings/Discharge

Findings	Most likely Diagnosis
i. Painful swelling:	Mastitis
ii. Painful cystic swelling:	Abscess
iii. Painless cystic swelling:	Galactocele
iv. Painless solid swelling:	Fibroadenoma or Carcinoma
v. Unilateral nipple retraction:	Carcinoma [Ca.]
vi. Peu d' orange skin:	Ca. infiltrating lymphatics
vii. Puckering of skin:	Ca.infiltrating Cooper's ligaments
viii. Blood discharge from single duct:	Blood discharge from single duct:
ix. Swelling with blood stained nipple discharge:	Carcinoma
x. Swelling fixed to skin/ underlying structures:	Carcinoma

Inguino-Scrotal Swellings

Findings	Most likely Diagnosis
i. Can reach above the swelling:	Purely scrotal swelling
a. Painful:	Epididymo-orchatis/torsion
b. Painless solid:	Testicular tumor
c. Painless cystic, fluctuant, trans-illuminant:	Hydrocele
ii. Cannot reach above the swelling:	Inguino-scrotal swelling
a. Painless reducible:	Hernia
b. Painful irreducible:	Strangulated hernia

Abdomen

Findings	Most likely Diagnosis
i. RIF pain, vomiting, fever:	Acute appendicitis
ii. RIF mass, tender, guarding:	Appendicular mass
iii. RIF mass, tender, rigidity:	Appendicular abscess
iv. RIF mass, non tender:	Tuberculosis/Carcinoma
v. LIF mass, tender, guarding:	Diverticulitis
vi. LIF mass, tender, rigidity:	Perforated diverticulum
vii. LIF mass, non tender:	Carcinoma
viii. Shifting pain and tenderness:	Mesenteric adenitis
ix. Generalised pain with rigidity:	Peritonitis
x. Epigastric pain and vomiting:	Acute gastritis/Pancreatitis
xi. Epigastric pain relieved by forward bending:	Acute pancreatitis
xii. RHC colicky pain:	Biliary obstruction
xiii. RHC continuous pain:	Cholecystitis/Hepatitis
xiv. RHC colicky pain with jaundice:	CBD stones
xv. RHC pain with palpable tender mass:	Empyema of gall bladder
xvi. Painful Post-Hepatic jaundice:	Calcular obstruction
xvii. Painless Post-Hepatic jaundice:	Pancreatic/ampullary tumor
xviii. Painless epigastric solid mass:	Gastric/pancreatic cancer
xix. Painless epigastric cystic mass:	Pseudo-pancreatic cyst
xx. Painless expansile pulsatile mass:	Aortic aneurysm
xxi. Painful tender epigastric mass:	Sub-phrenic abscess
xxii. Colicky pain, increased bowel sounds:	Intestinal obstruction
xxiii. Continuous pain, silent abdomen:	Paralytic ileus

RIF=Right iliac fossa.
LIF=Left iliac fossa,
RHC=Right Hypochondrium.

Ano-Rectal Pain/Swellings/Bleeding

Findings	Most likely Diagnosis
i. Painful bleeding:	Anal fissure
ii. Painless bleeding:	Haemorrhoids/Tumor
iii. Painful bluish perianal swelling, without bleeding:	Perianal haematoma
iv. Perianal haematoma without bleeding:	Perianal abscess
v. Painful swelling with bleeding:	Sentinal pile/Thrombosed piles
vi. Painless swelling without bleeding:	Skin tag/warts/Anal papilla
vii. Painless swelling with bleeding:	Cancer/prolapse
viii. Discharging openings around anus:	Ano-rectal Fistulae

The Lower Limbs

Findings	Most likely Diagnosis
i. Bilateral pitting oedema:	Generalised Anasarca
ii. Bilateral non pitting oedema:	Lymphoedema
iii. Unilateral pitting oedema:	Pelvic venous compression
iv. Unilateral non pitting swelling:	Mycosis/Filariasis
v. Unilateral painful swelling:	DVT
vi. Painless, pulseless, cold, black shriveled foot:	Dry gangrene
vii. Painful, pulseless, swollen, bluish foot:	Wet gangrene
viii. Black patches on pulseless foot/toes:	Ischaemic necrosis
ix. Painless ulcer on pressure points of sole:	Trophic ulcer
x. Dark pigmented non healing ulcer on sole:	Melanoma
xi. Non-healing ulcer above medial maleolus:	Venous ulcer/ Marjolin’s ulcer
xii. Painless, pulseless swollen foul smelling foot:	Diabetic foot

Chest Trauma

Acute Respiratory distress following trauma:

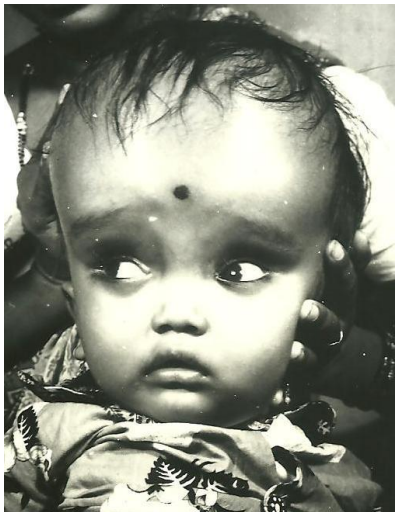
Findings	Diagnosis	Action
i. Gasping for breath, accessory respiratory muscles in action:	Airway obstruction.	Clear the airway
ii. Whistling sound from chest:	Sucking chest wound.	Immediate wound cover
iii. Paradoxical Respiration:	Flail chest.	Positive pressure ventilation
iv. Flushed blue face with prominent neck veins:		
a. Unilateral hyper-resonant chest with mediastinal shift.	Tension pnuemothorax	Needle decompression
b. Unilateral dull chest with mediastinal shift.	Massive haemothorax.	Chest tube insertion
c. Unilateral silent chest with mediastinal shift to same side.	Lung collapse	Check trachea-bronchial tree for obstruction
d. Increased cardiac dullness with muffled heart sounds.	Cardiac tamponade	Needle aspiration

Rare Pictures for Spot Diagnosis

Pictures of some extremely rare surgical conditions from my archives have been included in this chapter as a matter of curiosity.

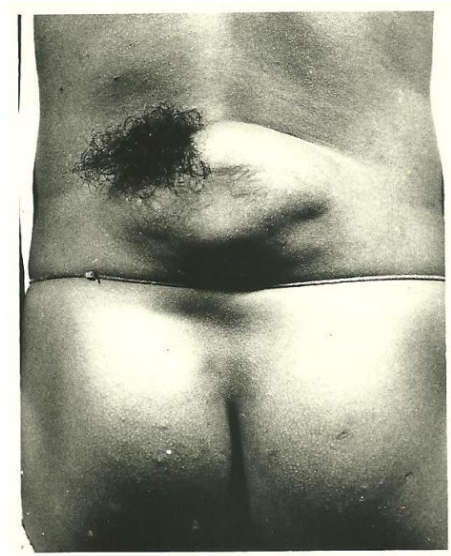
Discussion in detail on these conditions is beyond the scope of this book.

The objective is to motivate readers for further reading on these subjects.



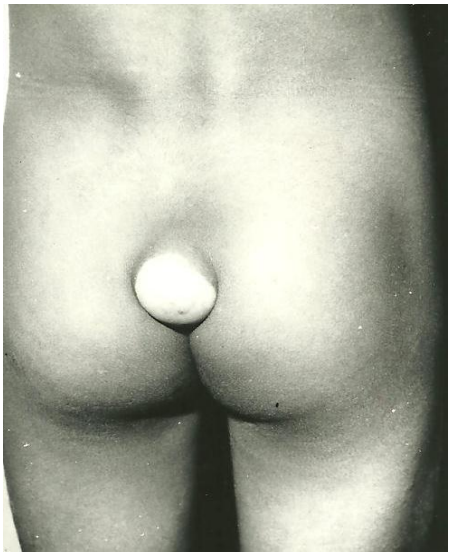
Congenital Hydrocephalus

Meningoceles and Encephaloceles are developmental disorders of cranium

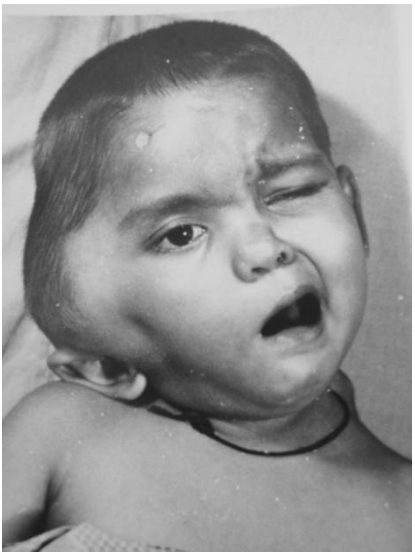


Spina bifida, a tuft of hair on lower back suggests its presence

Spinal Meningoceles and Meningomyeloceles can be associated with spina bifida



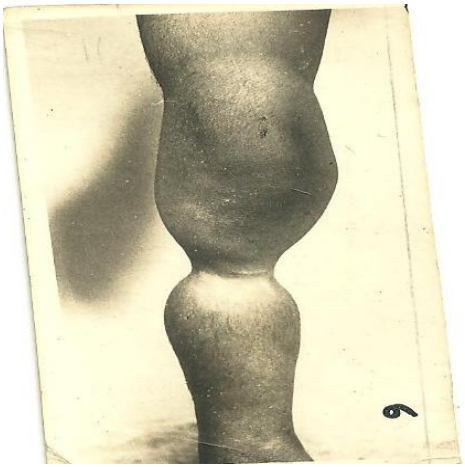
Chordoma from remnants of Notochord, a rare tumor



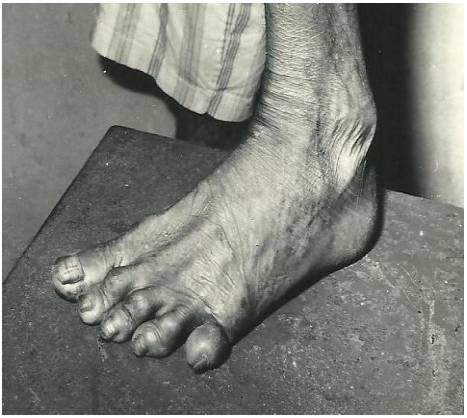
Neuroblastoma of seventh cranial nerve, a rare tumor

Imperforate Anus, a form of ano-rectal malformation

Vaginal Botyroid tumor is a form of Rhabdomyosarcoma



Congenital progressive constriction at upper end of leg, no distal vascular compromise



AINHUM, congenital progressive stricture at the base of little toe, ending in auto-amputation

On a Lighter Note

Culinary Metaphors in Medicine [Fascination of Medical Fraternity with Food]

Food item	Medical term	Associated condition
Walnut	Walnut shaped brain	
Chestnut	Chestnut shaped prostate	
Beans	Bean shaped kidneys	
Sweet potato	Pancreas	
Crab	Cancers	
Potato	Potato nose	Rhinophyma
Oats	Oat cell tumor	carcinoma of lung
Cauliflower	Cauliflower like growth	Proliferative tumors
Onion	Onion peel appearance	
Rice	Rice water stool	Cholera, dysentery
Sausage	Sausage shaped mass	Amoebic liver abscess
Sausage	Sausage shaped mass	Intussusceptions
Currant	Red currant jelly stool	Intussusceptions
Egg	Egg shell crackling	Surgical emphysema
Orange	Peu d'Orange appearance	Breast Cancer
Apple	Apple core appearance	Colon cancer
Strawberry	Strawberry tumor	Naevi
Cherry	Red cherry tumor	Umblical haemangioma
Grapes	Botyroid tumors	Rhabdomyosarcoma
Pears	Pear shaped swelling	Indirect inguinal hernia
Nutmeg	Nutmeg liver	Liver cirrhosis
Tea	Tea colored urine	Obstructive jaundice
Coffee	Coffee ground appearance	Haematemesis
	Caf éau le spots	Liver cirrhosis
	Coffee bean appearance	Volvulous
Bread and butter	Bread and butter adhesions	Early adhesions

Summary

This book is meant for students of surgery as an introduction. It is intended to serve as a companion during their clinical teaching session, and for a quick revision before examinations. It covers most of the common subjects in simple form. It is not comprehensive.

Knowledge from this book must be supplemented by details on required subjects from any standard text book.

Only common subjects are covered. Emphasis is on explaining the information obtained from patient's history and examination, and its analysis based on patho-physiology and knowledge of applied basic medical sciences.

Author keenly awaits the response from students and teachers on this first edition of the book. It will help in reviewing and revising further editions.

Hopefully students and teachers will oblige.

Author welcomes all the readers of the book and thanks them in anticipation for their comments and contributions.