General Principles of Amputation Surgery

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Amputation

A procedure that removes a part of a limb through one or more bones .

Disarticulation

A procedure that removes a part through a joint.

The term amputation is applied to both procedures

Amputation

Is the most ancient of all surgical procedures

History of Amputations

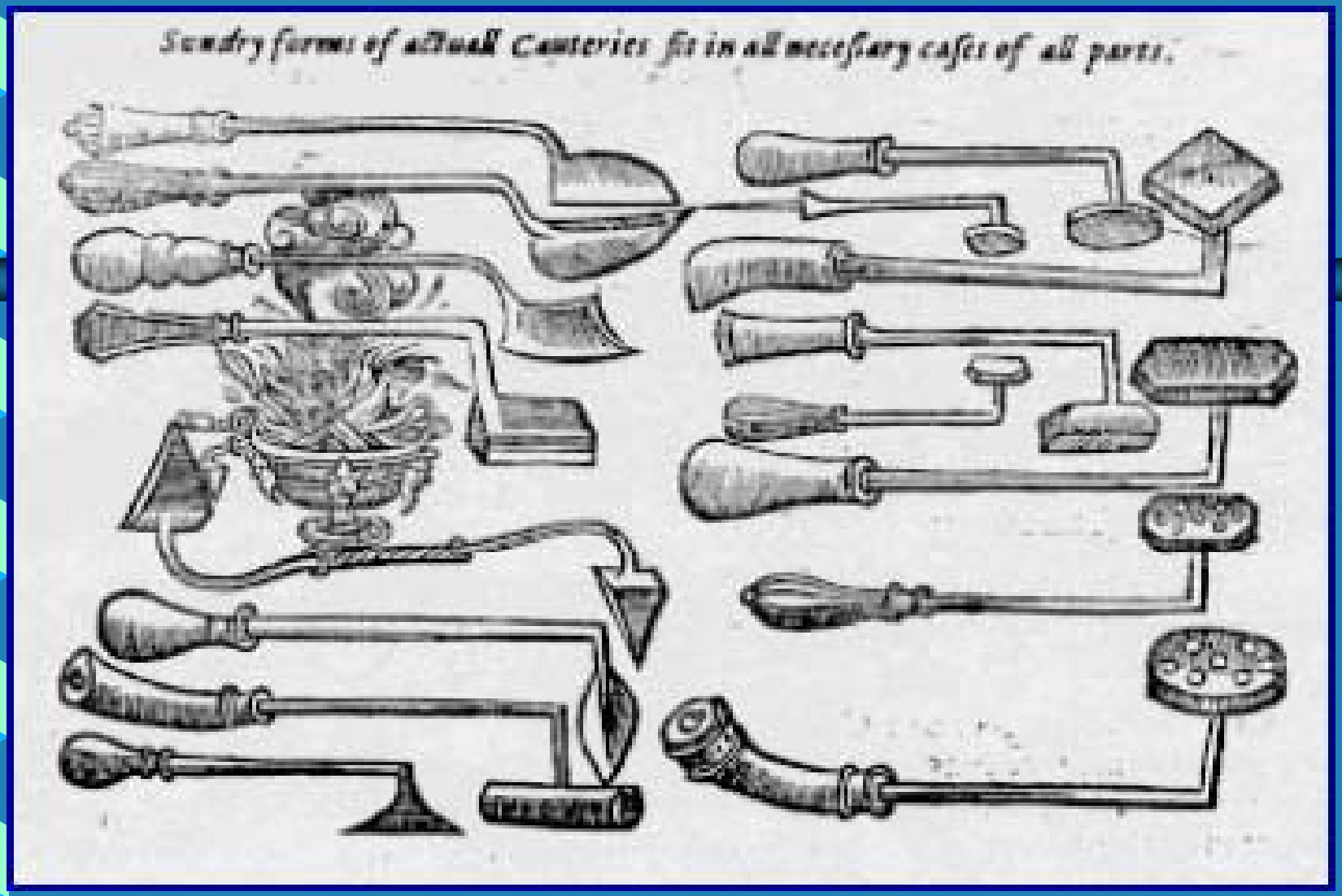
Treatment	Punishment	Cosmetic
Wounds	*Stealing*	*Sacrifice*
Fractures	*Laziness*	*Mimic amputee gods*
Deformity	*Rebellion*	
Infection		
Gangrene		
Ergotism		
Pain		

World War I Amputation

Early Surgical amputation

1- The limb was rapidly severed from an un-anesthetized patient.

2-The open stump was crushed or was dipped in boiling oil, for hemostasis .


Sundry forms of actuall Cauteries fit in all necessary cases of all parts.

Early in the Sixteenth century

Amputation surgery and prosthetics were much improved by

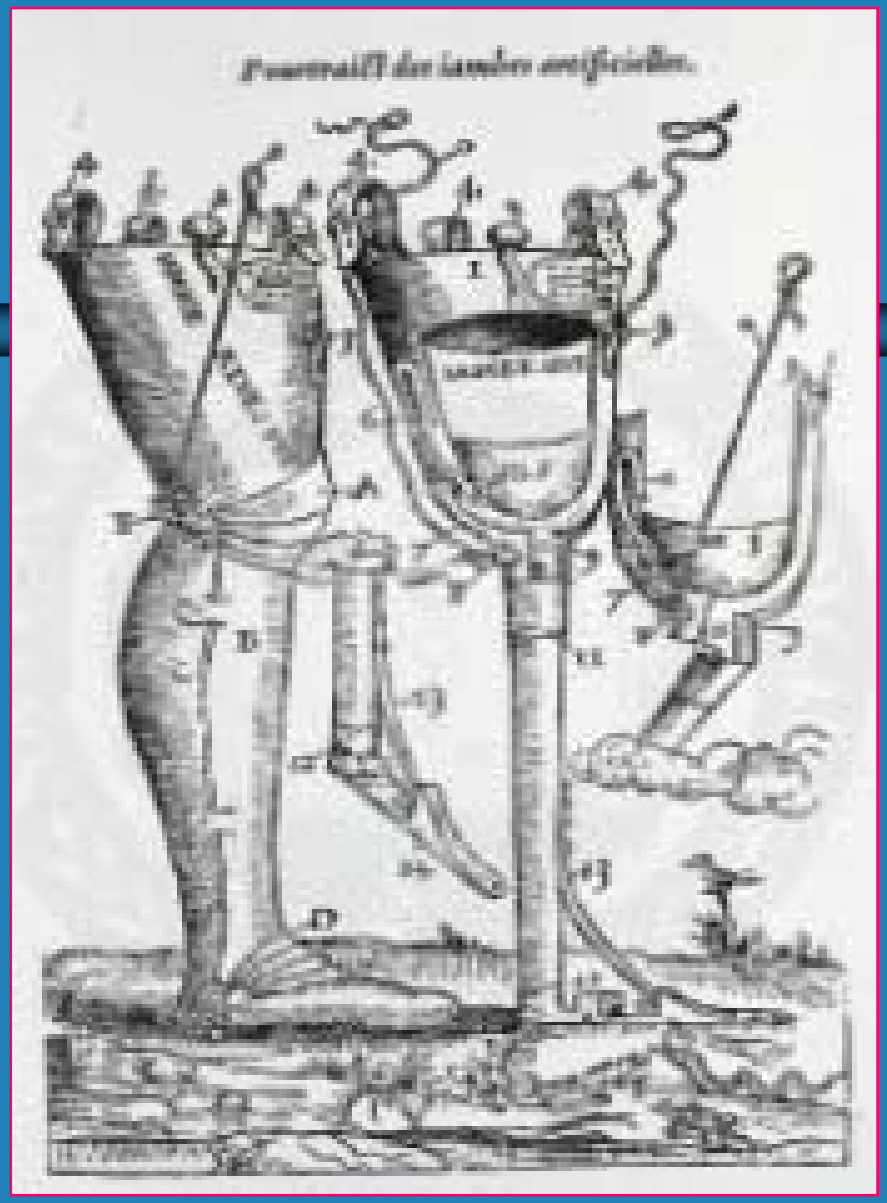
Ambroise Paré,
a French military surgeon.

Ambroise Paré

1- Created more functional stumps.

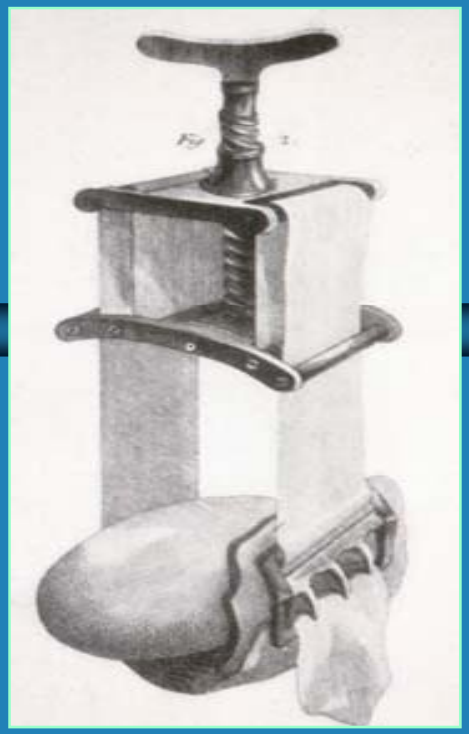
2- The first to use ligatures to control bleeding after amputation

3-He designed relatively sophisticated prostheses.



Seventeenth century

Amputation surgery was further improved by Morel's introduction of the *Tourniquet*




Cruris exstirpatio.
Anno 1660.

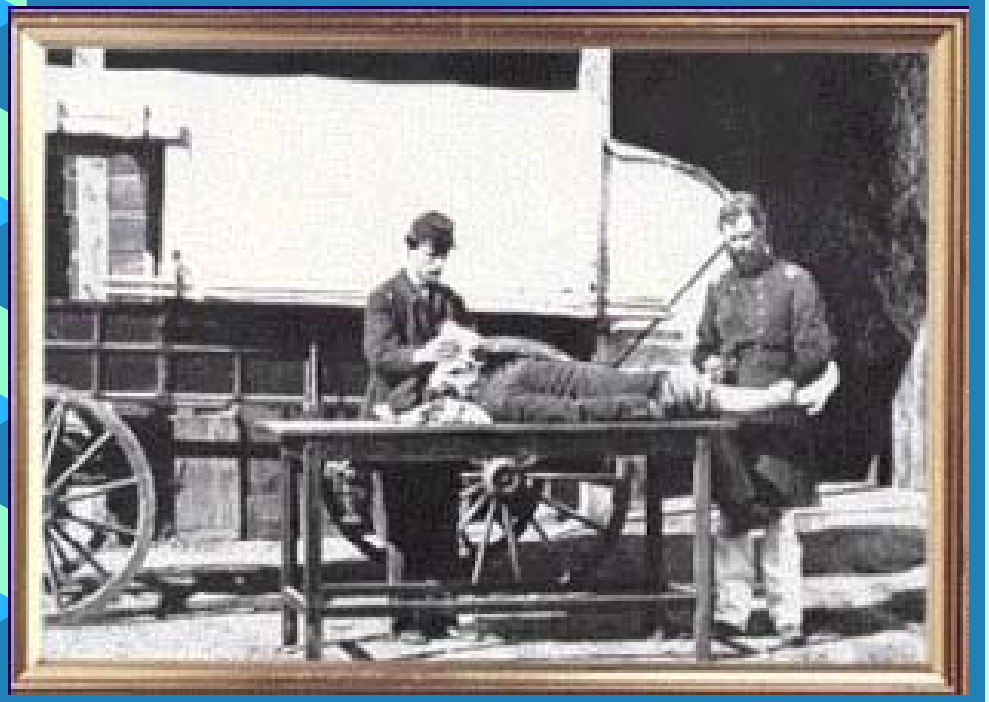
With the development of anesthesia and aseptic technique

Surgeons for the first time

1-Could carefully fashion sturdy and functional amputation stumps

2-Could reasonably anticipate healing of the wound without infection

War Anesthesia



- Chloroform
- Ether
- Opium
- Whiskey
- Quinine

War Surgical Tools.

INCIDENCE OF AMPUTATION

USA

Prevalences from 350,000 to over 1 million amputees .

20,000 - 30,000 new amputees each year.

* 85-90 % in L.L
- 50% are below knee
- 40% above knee
- 10% are hip Disarticulations
* R=L
* 75% in men

Amputee Incidence

- Approximately 310,000 in USA
  - 2/3 are missing a lower limb (1996)
  - 7% are below 21 years of age
    - >% missing upper limb
    - Twice as often due to congenital

INDICATIONS FOR AMPUTATION

Irreparable loss of the blood supply of a diseased or injured limb is the only absolute indication for amputation regardless of all other circumstances.

Goals

1-Ablation of diseased tissue

2-Reconstruction:

3-Optimize pt function and reduce morbidity to produce a physiological end organ.

4 -Reduce mortality

General indications for amputation

1-P V. DISEASE → 78%

2-INJURY → 20%

3-INFECTION

4-TUMORS → 5%

5-NERVE INJURIES

6-CONG. ANOMALIES → 3%

PERIPHERAL V. DISEASE

=In elderly people

D.M & vascular diseases are more common in this age group.

=Gangrene of a limb caused by arteriosclerosis

more difficult to treat in the presence of D.M because the tissues heal poorly and are more susceptible to infection in diabetic patients

PERIPHERAL V. DISEASE

=Diabetic Neuropathy.

Even when sub clinical, can cause delayed healing when diminished sensation results in repeated but unnoticed injuries

INJURY

The 2nd most common indication for amput.

1= Crush injury: when the blood supply of a limb is irreparably destroyed or when the limb is so severely damaged that reasonable reconstruction is impossible

2= Thermal burns or frostbite

may destroy enough tissue to make amputation necessary

3= Severe electrical burns

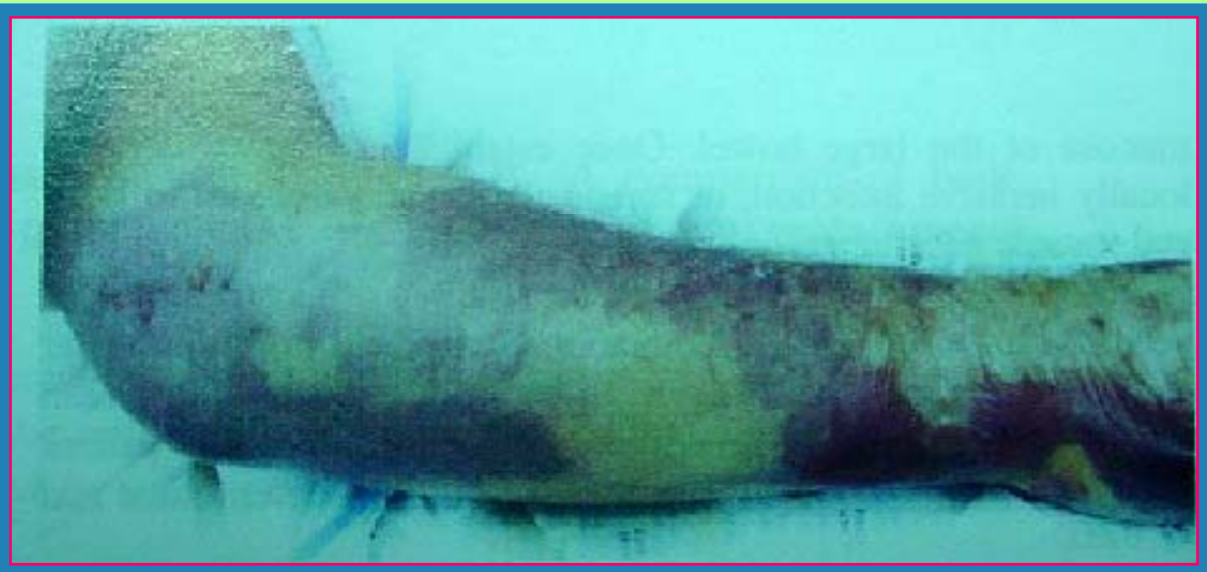
often require amputation

INFECTION

Infection, either acute or chronic, that is unresponsive to medical or other surgical measures may be an indication for amputation.

1-fulminating gas gangrene

Most dangerous and usually demands immediate amputation at a proximal level through normal viable tissues



2-Chronic Osteomyelitis or an infected un-united fracture

3- Carcinoma

develops in a chronic draining sinus

4- T.B lesions of the foot & ankle

when secondarily infected.

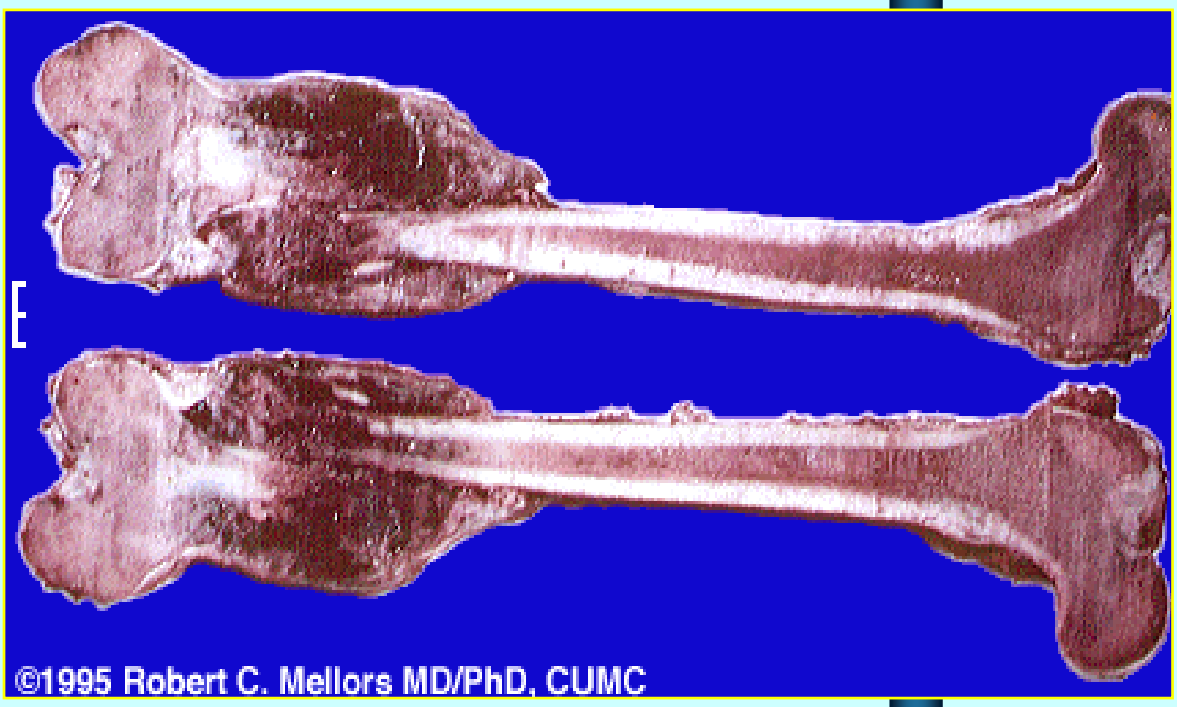
TUMORS

= Malignant tumors

(to remove the malignancy before it metastasizes)

= Amputation after metastases

(to relieve pain when a neoplasm has become ulcerated and infected or has caused a pathological fracture)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NERVE INJURIES

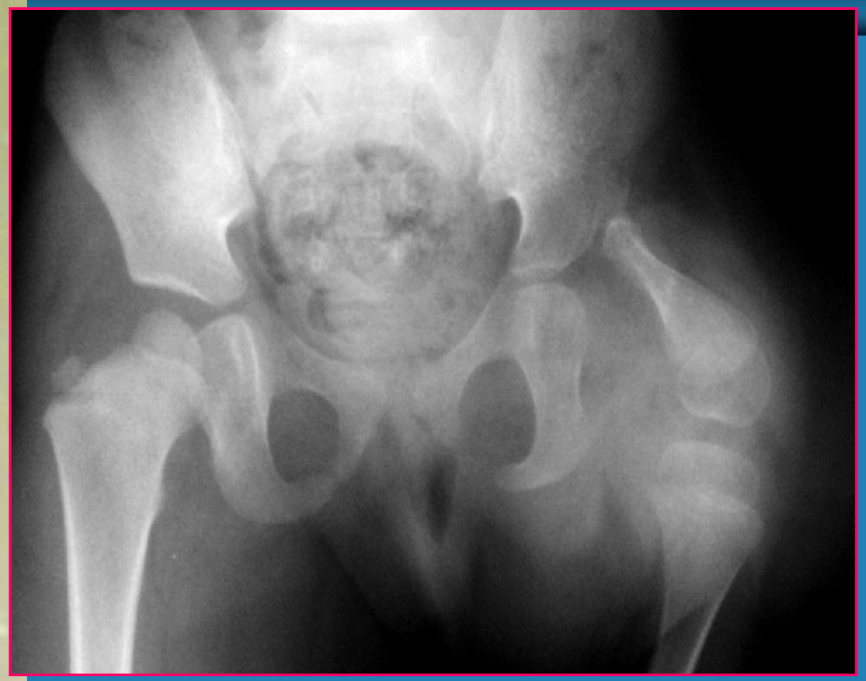
=Trophic ulcers in an anesthetic limb.

=Functionless limb.

CONGENITAL ANOMALIES

1- Fibular hemimelia & tibial hemimelia.

2- PFFD.



Preop. Evaluation

Tissue

1. Clinical

   Pulses, Skin temp., level of dependent rubor

2- Doppler

Ankle/ Brachial index

3-Toe systolic BP

4-Transcutaneous PO2 for assured healing

5-Arteriogram

6-Others:

Skin blood flow (Xe 133 clearance)
Thermography
Thallium scanning

Immune Competence

Serum albumin at least 3g/dl

WCC more than 1500/ mL

Systemic

= Control D.M

= Evaluate

Cardiac, Renal + Cerebral circ.

= Preop TPN in malnourished pt

Psychological

= Early plan for return to function
= Preop Counselling
= Amputee support groups

Preop Pain Control

Pain Clinic review
Spinal anaesthesia


Thank You