Traction
Then and Now

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Traction

- Application of a pulling force to an injured or diseased part of the body or an extremity while a countertraction pulls in the opposite direction

- Requires the use of ropes, weights and pulleys as a means of counteracting the natural tension in the tissues

- Countertraction is usually the patient’s body

Once the preeminent treatment option, but has been replaced by ORIF as the treatment of choice

BUT not always and not in developing countries
Our Orthopaedic History

Orthopaedics
derived from Greek words for "correct" or "straight" ("orthos") and "child" ("paidion")

Nicholas Andry 1741
Orthopaedia: or the Art of Correcting and Preventing Deformities in Children

Jean-Andre Venel 1780 “father of orthopaedics”
He established
the first orthopaedic institute in the first hospital
dedicated to the treatment of children's skeletal deformities
My Hero – Agnes Hunt

Founded with Robert Jones first UK orthopaedic hospital

‘..., we decided that as the doctors all advocated fresh air, we would build a shed in the garden and I should sleep there with the bad cripples and only children who could walk should go upstairs.....’.
The instruments of the “Bonesetter......”

Changing ideas have shaped the discovery and evolution of orthopaedic technology

Advances - use of computers as instruments in the navigational guidance the use of robotics

Cordless drills and improvements in the design of saws

Yet some of the old instruments remain:

- Plaster of Paris bandages
- Liston’s bonecutter
- Gigli’s saw, Macewan’s osteotomes

The Thomas Splint
But all evolve..........
Hugh Owen Thomas (1834–1891)
- A calliper splint for TB

Sir Robert Jones (1857–1933)
- Introduces military orthopaedic hospitals during WW1
- Adapts Thomas splint for femoral shaft fractures
- Mortality rates dropped from 80% to nearly 12%
The Thomas Splint Today

Temporary or as definitive management
Adapted into Emergency management

Initial reduction of femur fractures prior to OR skeletal traction
A Tour of Traction

Evolution
Place in orthopaedics

Methods.
Indications / Complications
TRACTION

TYPE OF TRACTION:

1. Manual traction
2. Skin traction
3. Skeletal traction
4. Traction by gravity
SKIN TRACTION

Advantages

- Easy to apply
- No hazard of bone infection or epiphyseal plate injury

Disadvantages

Limited force not to exceed 3 kilos
More common for paediatric patients
Can cause soft tissue problems especially in elderly or rheumatoid patients

http://www.narang.com/
Foam TRACTION
SKELETAL TRACTION

May pull up to 20% of body weight for the lower extremity
Requires local anaesthesia for pin insertion if patient is awake
Preferred method of temporary management till ORIF
SKELETAL TRACTION

- Infection
- Over distraction of the bone fragments
- Nerve damage: excessive traction forces
- Breaking of the pins or wire
Upper Extremity Traction

- Can treat most fractures
- Requires bed rest
- Usually reserved for comatose or multiply injured patient or settings where surgery cannot be done
Forearm Skin Traction

- Adhesive strip
- Useful for elevation in any injury
- Can treat difficult clavicle fractures with excellent cosmetic result
- Risk is skin loss
Dunlop’s Traction

- Supracondylar and trans condylar fractures in children
- Used when closed reduction difficult or traumatic
- Forearm skin traction with weight on upper arm
- Elbow flexed 45 degrees
Halo Traction

- Unstable C spine #
- Pre Op

Preoperative Halo-Gravity Traction severe scoliosis
Halo Brace

- Adult and children
- C1-3 fractures – dens
- Application – Sedation-Orthotics/ surgeon

Complications
- Pin loosening
- Pin Infection
- Falls risk
- Functional decline
LOWER EXTREMITY TRACTION

- Can be used to treat most lower extremity fractures of the long bones
- **Requires bed rest**
- Used when surgery cannot be done for one reason or another
- Uses skin and skeletal traction
Buck’s Traction

- Used preoperatively for femoral fractures
- Not used to obtain or hold reduction
Split Russell’s Traction

- Buck’s with sling
- May be used in more distal femur fx in children
- Can be modified to hip and knee exerciser
The Thomas Splint Today

Temporary or as definitive fracture management
Adapted into Emergency management

initial reduction of femur fractures prior to OR skeletal traction
Distal Femoral Traction

Method of choice for acetabular and proximal femur fractures
SLIDING TRACTION WITH BOHLER BROWN SPLINT:

Used for the fracture of tibia or femur.
Skeletal traction is usually applied, but skin traction can be given b/k.
Balanced Suspension with Pearson Attachment (on Thomas splint)

- Enables elevation of limb to correct angular malalignment
- Counterweighted support system
- Four suspension points allow angular and rotational control
Slings and Springs

Not true traction
Holds the leg in suspension with no true counter traction.
Restoring rom gradually to an irritable hip, by abducting the affected leg
Rests the hip joint in a flexed position whilst allowing active movement - perthes

Mobilisation while a patient is non-weight bearing following femoral and tibial osteotomy.
Birth to Six Months DDH

Pavlik harness (1944)
- Experienced staff*
- Very successful
- Allows free movement within confines of restraints
Gallows TRACTION

Children <12 months (and not walking) or weighing 10 to 16kgs.

Indications

fractured shaft of femur
to stretch the soft tissues pre-operatively for DDH

http://www.complete-healthcare.co.uk/
Ultrasound-guided gradual reduction using FACT flexion and abduction continuous traction - DDH
Traction Splint

Hare traction splint


Sager Traction Splint

Quick Action Traction

Quick Action Traction Splint
Dynamic External Fixation
Value of traction today...

- Safe and dependable way of treating fractures for more than 100 years
- Bone reduced and held by soft tissue
- Less risk infection at fracture site
- No devascularization
- Allows more joint mobility than plaster
Disadvantages

Costly in terms of hospital stay

Hazards of prolonged bed rest
  – VTE
  – Decubiti
  – Pneumonia
  – Delirium
  – Functional decline

• Requires meticulous nursing care
Orthopaedic Care in Developing Countries

Most injured patients worldwide have no access to an orthopaedic surgeon.

Trauma and Infections common

Minimal resources
Simple Techniques - Great Benefit

Casts / Splints / Traction
Orthopaedic Ward 1970s UK
Orthopaedic Ward Manilla 2015
Questions?
Useful Links

- RCN Traction guidelines

- RCN competence framework for orthopaedic and trauma Practitioners

- Paediatrics
  NSW Traction

  Vic NV assessment

DDH


Traction handbook Zimmer


U Tube have extensive lists of traction videos