Basic Instruments for Spinal Operations

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Objectives

• Identify different basic spinal instruments

• Recognize their usage & related care

• Recognize instruments for Screws/Hooks/Wires
Overview

1) Basic spinal instruments

2) Optional Spinal Instruments

3) Instruments for Screws / Hooks / Wires

4) Example of a cervical instrumentation system
1) Basic Spinal Instruments

- Retractor
- Elevator
- Posterior Shear Cutter
- Curette
- Osteotome / Chisel
- Dissector / Nerve Root Retractor
- Bone Rongeur
Retractor
Mollison
Self-retaining Retractors
- 1-2 levels hemi-laminectomy
- cervical
Downing spinal retractor
Cervical Retractors
Meyerding Retractor
Periosteal Elevator
Posterior Shear Cutter
Currette
Ligamentum Flavum
Osteotome / Chisel
Osteotomes

Angled / Bayonet - shaped

chisels
Sharp edges protected
Dissector & Nerve Root Retractor
Nerve root with a patch of fat

Herniated disc
Nerve root retractors

Probe Dissector

Allerdyce

MacDonald

Howarth
Probe Dissector
Nerve root retractor
Bone Punches & Rongeurs
• Up-cutting

• Down-cutting
Narrower tip – Cervical level

Broader tip – Thoracic to Lumbar level

End plate

Cutting edge
Grooved +/- centring pin
Pituitary Rongeur
Cup-shaped jaw

Serrated jaw
2) Optional Instruments

- Cervical Instruments
- Thoracic Instruments
- Lumbar Instruments
- Bone Graft Instruments
- Power Instruments
Hartman’s retractor
(cervical)
Cervical Distractors – intervertebral space distraction

(for cervical ASF)
Cervical Distractor
Thoracotomy
Instruments – anterior approach

- Lung Retractor
- Costotome
- Rib approximator
- Rib Shears
- Perioteal Elevators
- Rib Spreader
Instruments for Lumbar level – anterior approach
Shoehorn Retractor for lumbar spine
Longer instruments used in deep cavity -- Thoracic to Lumbar levels
Bone Graft Instruments

Taylor retractors

Bone Impactors

Ruler

Bone currettes
Capener Gouge

Bony decortication on concave side, using Capener gouge
3) **Instruments for Screws/ Hooks/Wires**
USS-Fracture System. Fracture Fixation for Spine.
Instruments for Screw / Hook / Wires
Screw site preparation

- under X-ray control

1. Bone awl - perforate outer cortex of pedicle

2. Pedicle probe

3. Sound probe
Pedicle Probe
- path finder
- Open pedicle canal

Sounding Probe
- pedicle feeler
- ball tipped
- ensure path is surrounded by bone
Screw Fixation

Taps

Wrench
Screw fixation
Instruments for Hooks
Hook starter

-for lamina hook, to separate ligamentum flavum at underside
Hook holder

Hook driver

Hook insertion
For lamina hook, a small osteotome used to remove some part of lamina for easy insertion of lamina hook.
hooks
Instruments for Rod
Rod Cutter

Align the two lines

Implant this end

Discard this end

Figure 20a

Table - top
Rod Holder

Serrated jaws
Distractor & Compressor

Effect on the screw-to-rod clamps → lordosis

compressor
distractor
Final tightening of screw cap

-wrench with side handle acts as a counter torque device allowing screw tightening
Final tightening with torque immediate after compression or distraction.
Wire Instruments

- Wire Tightener
- Wire Cutter
- Pliers
Transverse connector

Reduce rotational instability
Cervical instrumentation
Awl – marks the entry point, prevent drill bit slipping
- Pedicle probe / path finder/ drill to make the path for screw

- Pedicle marker or feeler to check the depth of the screw path
Or using power drill to drill path, with a drill sleeve with depth stop
- Depth gauge to measure required screw length
- Tapping is optional
• Insert polyaxial screw with screw driver
Use rod template as a guide to bend rod
• Rod benders
Insert rod with a rod holder
Locking cap screwdriver to mount caps onto screw head, but not too tight.
• Or using the rod introduction instrument /persuader to push rod onto screw head, by squeezing the handle

• Locking screw is inserted thro the cannulation of the instrument
• Compressing or distracting screws at required level in increase or decrease lordosis as required

• The locking screws should be loosely fastened before using the compressor or distractor then tightened
Place the selected transverse connector over the appropriate level on the construct (with extended locking screw) with a holding forcep.
- hex screwdriver to thread locking washer over the stardrive locking screw

- Then final tightening of the stardrive locking screws with countertorque
Lock the transverse connector with a crimper
To add transverse bar to prevent severe rod contouring.

- Can be placed onto rod from top.
Connect lamina substitute with a 3.5mm rod

-- mount from top

--tighten screw with hex driver
- Can be placed from top

- lock the set screw on the rod

- Lock the swivel ring on the both sides of connector with hex driver
Summary

- Recognise basic Spinal Instruments

- Preparation of instruments for spine operation at different level
  - Basic
  - Optional: appropriate inst for required level
    (Consideration: Approach, spinal instrumentation, Bone grafting, Power instruments, Surgeon’s preference)

- Instruments for pedicle screw / hook / wire

- Example of a cervical instrumentation system
Thank you !!