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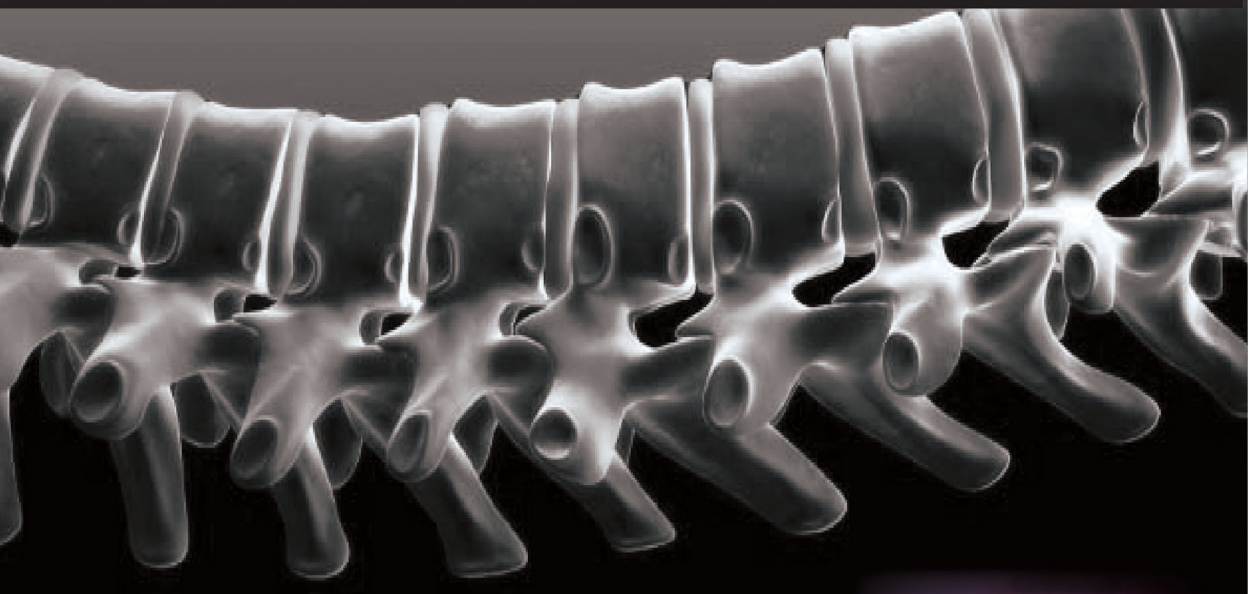

Neuro Spinal Surgery Operative Techniques

Lateral Mass Fixation in Sub-axial Cervical Spine



JKBC Parthiban

Foreword
PS Ramani

JAYPEE

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Chapter 4

Standard Screw Trajectories

There are many trajectories described in the literature regarding screw placement. The site of entry is either at the center or medial to the center of the lateral mass in order to gain the maximum purchase. Universally, each school has advocated placing the screws in the superolateral quadrant. However, the lateral angulation varies from 10° to 30° and the direction of the screws in the sagittal plane varies from the perpendicular to the long axis of the spine (straight ahead) to 40° cephalad (parallel to facet joints).

SCREW TRAJECTORIES AND CRITICAL POINTS

- The more medial and cephalad the trajectory, the more likely it is for nerve root injury to occur.
- Risks of facet joints and incorporation of the neighboring motion segment occur when the screws were directed strictly anterior.
- Various school of trajectories are enumerated.

School	Site of entry	Sagittal plane angulation	Lateral angulation
Roy Camille	Center	Straight ahead (perpendicular)	10°
Magerl	1–2 mm medial and rostral	40° cephalad and parallel to facet joints	25°
An, Trynalis, Haid	1 mm medial	15° cephalad	20°–30°
	1 mm medial	10°–20° cephalad	30°
Anderson	1 mm medial	Parallel to facet joints	10°
Cooper	1 mm medial	Perpendicular to long axis of spine	10°

Hence, a screw directed superiorly and laterally from the hillock will be placed in the superolateral quadrant thus avoiding the neurovascular structures.

Magerl Technique

Entry point: Just superior and medial to the hillock or the midpoint **(Fig. 4.1)**.

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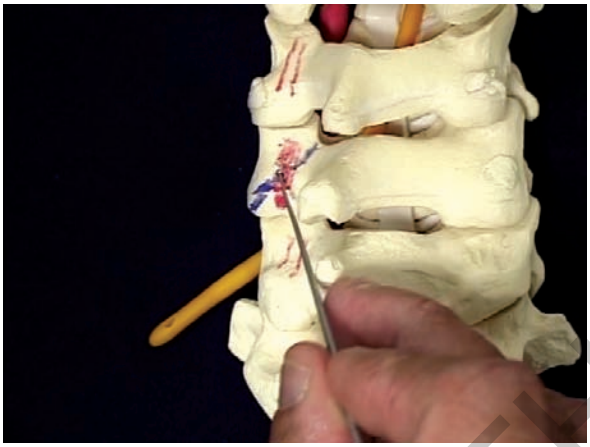
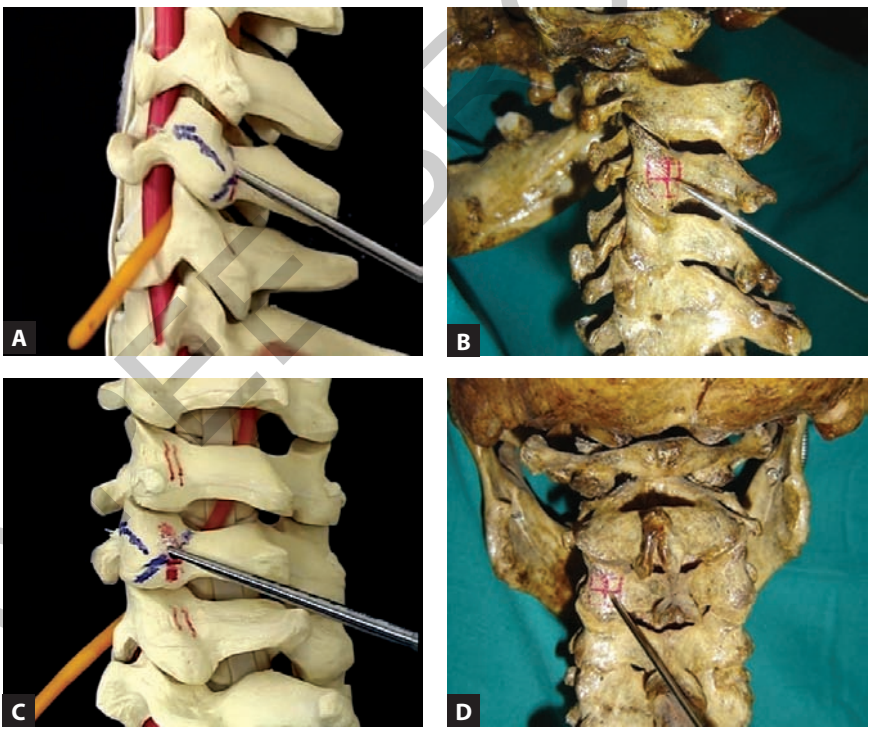


Fig. 4.1 Magerl entry point



Figs 4.2A to D (A and B) Superiorly directed; (C and D) Laterally directed

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Probing from this entry point is directed superiorly 40°—parallel to facet joint **(Figs 4.2A and B)** and laterally 25° **(Figs 4.2C and D)** until the distal cortex is pierced. The glow end of the probe usually come close to the spinous process of the inferior spine.

Screws placed in this way avoid neurovascular structures anteriorly **(Figs 4.3A and B)**.

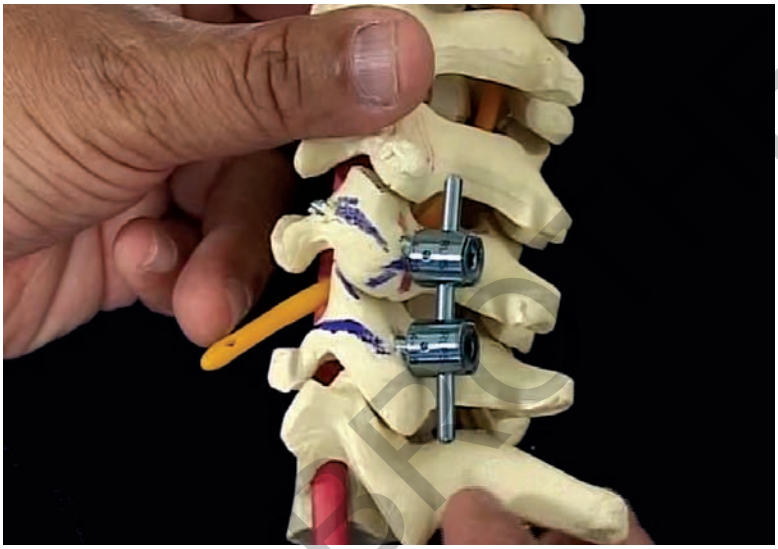
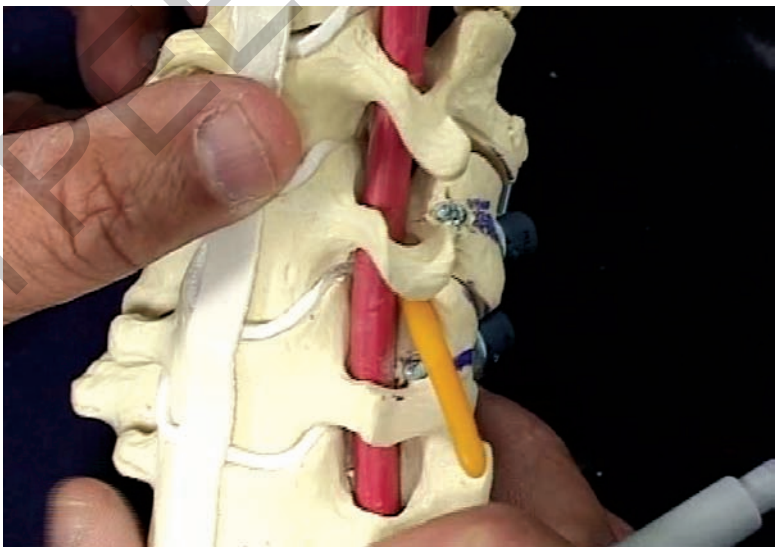


Fig. 4.3A Lateral mass fixation with bicortical screws



Figs 4.3B Note the distal end of screws not violating the neurovascular structures

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Lateral Mass Fixation in Sub-axial Cervical Spine

Salient Features

- Gives the insight of various steps in performing lateral mass fixation in sub-axial cervical spine
- Depicts the applied anatomy, demonstration on bone model and detailed surgical techniques during live operative surgery
- Case illustrations are unique for the readers to understand the indications in various complex situations
- It is an ideal book for the young spinal surgeons to read, understand and perform the technique in cervical spine.



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He is the inventor of double hook retractor in microlumbar discectomy, and he is a regular teaching faculty in the field of spinal surgery. He also conducts fellowship programs for young neuro and orthopedic surgeons in spinal surgery since 2001.

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