



PG Residency Hangman's Fracture

Smart Notes. Better Scores.



Traumatic Spondylolisthesis of C2-C3

(Hangman's Fracture)

- ✓ Comprehensive PG-Residency Rapid Revision
- ✓ Based on Levin & Edwards and Star & Eismont Classifications
- ✓ Focus on Pathoanatomy, Diagnosis, and Management Algorithms

Exam Pearl: "Hangman's Fracture" is a misnomer; traumatic spondylolisthesis is most commonly caused by RTAs (Road Traffic Accidents), not judicial hanging.



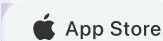
Orthopaedics
High-Yield Videos
Structured Syllabus Videos



Watch Now →



DocTutorials
Download Our App Now



Google Play

Click Here →

Definition & Pathoanatomy

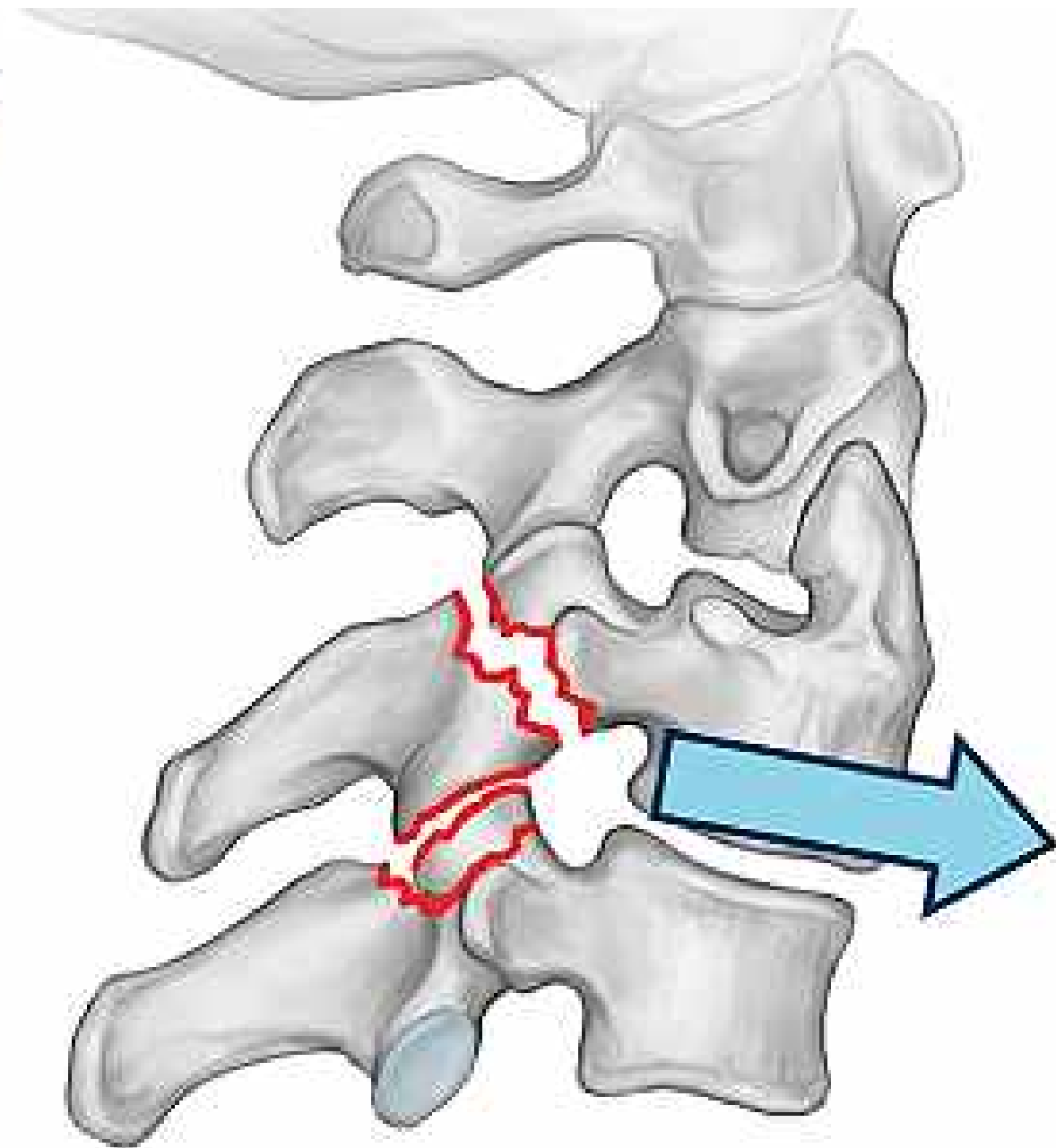
Defined strictly as traumatic spondylolisthesis of C2 over C3

“Spondylos” = vertebra; “Listhesis” = slip

Synonymous with traumatic disruption of C2 from the pars interarticularis

Term coined and described by Horton

Primarily caused by Road Traffic Accidents (RTAs)



Exam Pearl: The **primary anatomical failure point** defining this injury is the **bilateral C2 pars interarticularis**.



PG Residency

Orthopaedics Residency Program

Theory Videos, Clinical Cases, PYQs & Live Sessions

Enrol Now →



DocTutorials

Download Our App Now

App Store

Google Play

Click Here →

Radiological Landmarks

Normal Anatomy:

Lateral cervical spine X-ray is the primary modality for initial assessment

Normal anatomy: Anterior margin of most vertebral bodies aligns in a straight line



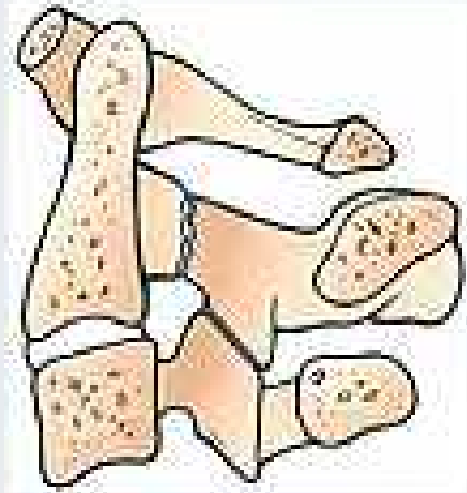
Pathology:

Hangman's pathology: Disruption of this anterior vertebral line at C2-C3

Affected C2 vertebra demonstrates anterior translation (spondylolisthesis)

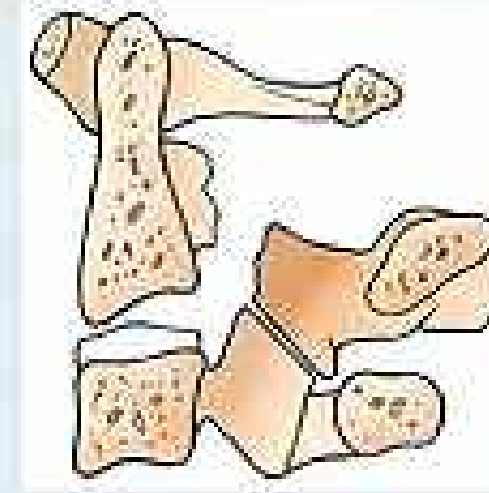
Exam Pearl: Loss of the straight anterior vertebral body line at C2 is the hallmark radiological sign of spondylolisthesis.

Levin & Edwards Classification: Types I & II



<3mm

Type I: Angulation/translation due to extension. Features substantial injury to C2-C3 interspace (relatively stable).



>3mm

Type II: Significant AP and angular deviation due to flexion. Considered unstable and frequently requires surgery.

Exam Pearl: The critical threshold differentiating stable from unstable injury patterns is 3mm of displacement.



PG Residency

Orthopaedics Residency Program

Theory Videos, Clinical Cases, PYQs & Live Sessions

Enrol Now →



DocTutorials

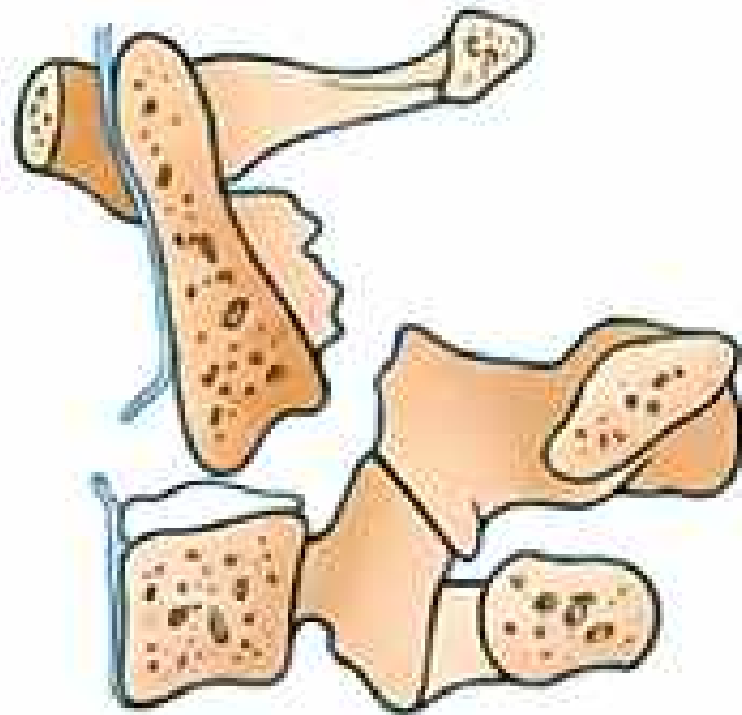
Download Our App Now

App Store

Google Play

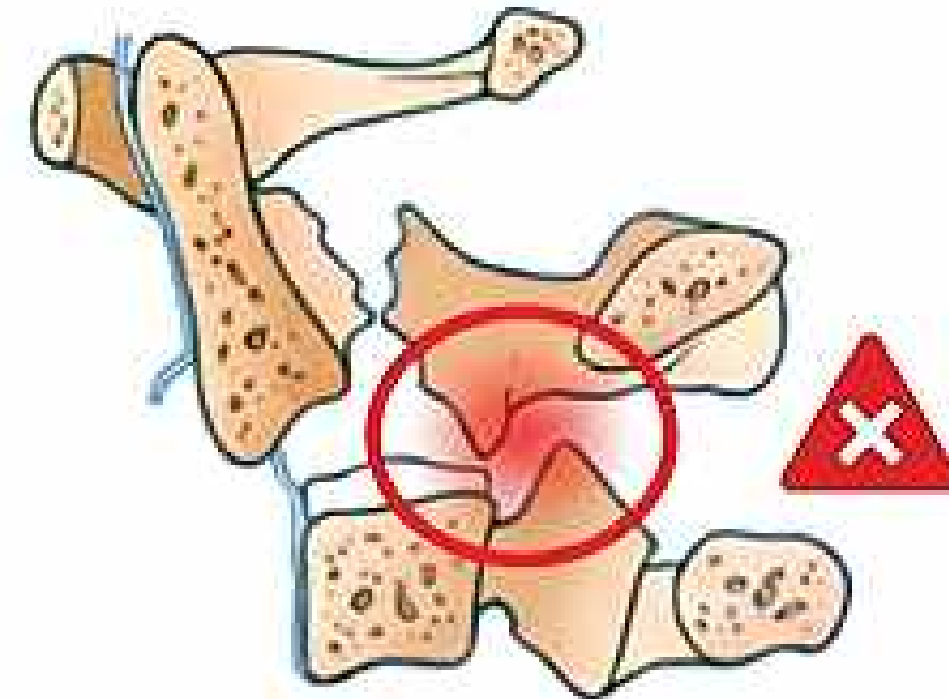
Click Here →

Levin & Edwards Classification: Types IIA & III



Type IIA: Horizontal/oblique fracture line

Horizontal/oblique fracture line with significant angular deviation. Crucially, presents **WITHOUT** anterior translation.



Type III: Any C2 pars fracture combined

Any **C2 pars fracture** combined with a dislocation of C2-C3 facet joint. Extreme instability requiring operative stabilization.

Exam Pearl: Type III is exclusively defined by the addition of a C2-C3 facet dislocation.



Orthopaedics
High-Yield Videos
Structured Syllabus Videos



Watch Now →

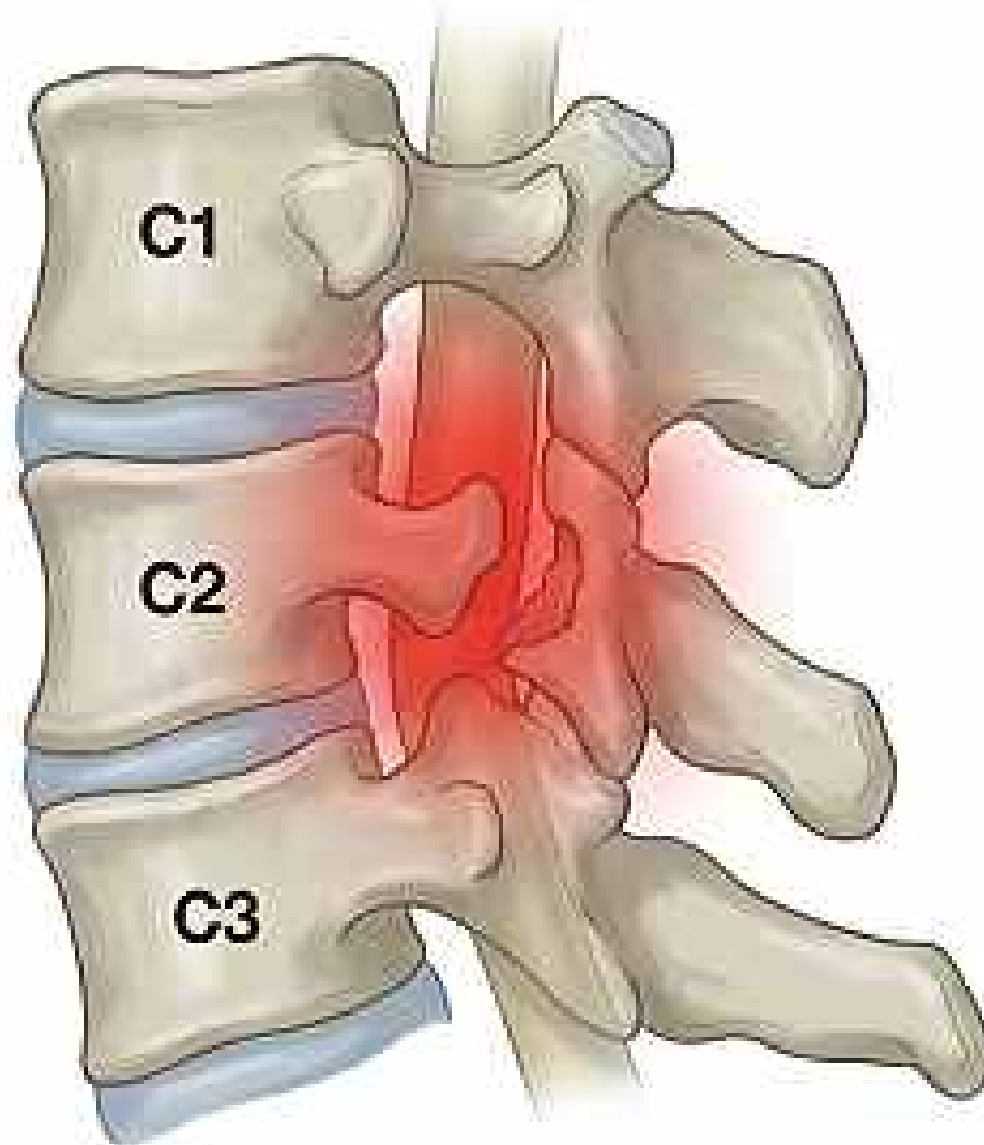


DocTutorials
Download Our App Now

App Store Google Play

Click Here →

Star & Eismont Modification: Type IA



Type IA

**Categorized within Type I injuries
(displacement <3mm)**

**Portion of posterior C2 body remains in
continuity with a pars fracture fragment**

**Mechanism: The posterior fragment
directly compresses the spinal canal**

**Despite minimal translation, carries a
high incidence of neurological deficit**

Exam Pearl: Type IA is the 'wolf in sheep's
clothing'—minimal displacement but a
high risk of spinal cord compression.



PG Residency

Orthopaedics Residency Program

Theory Videos, Clinical Cases, PYQs & Live Sessions

Enrol Now →



DocTutorials

**Download Our
App Now**

 App Store

 Google Play

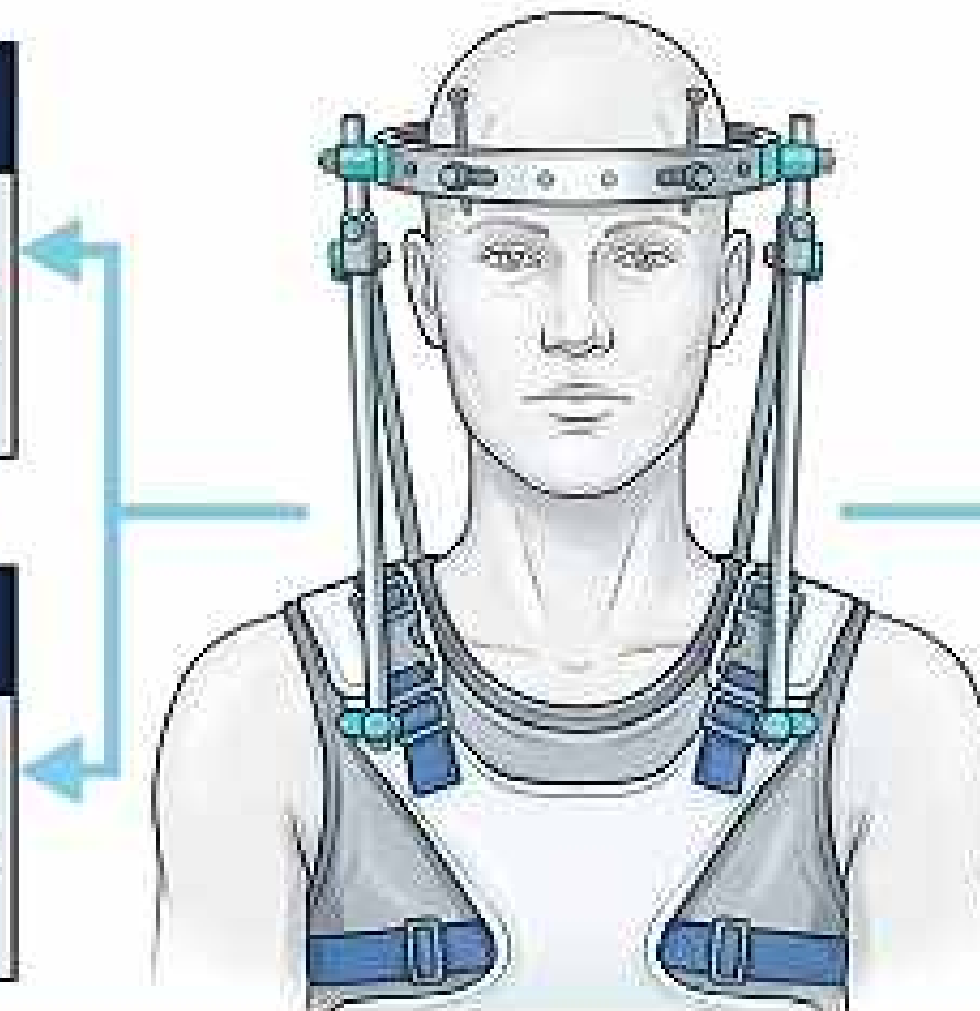
Click Here →

Non-Operative Management Principles

Preferred exclusively when neurological compromise or deficit is absent.

Type I & IA:
Cervical collar for 6–8 weeks (if no other cervical injuries/neuro deficits)

Type II:
Initial reduction via traction, followed by halo brace immobilization



Type IIA:
Halo immobilization in compression and extension

Exam Pearl: Stable Hangman's fractures rarely present with neurological deficits, making conservative treatment the standard for most non-displaced cases.

The “No Traction” Rule (Type IIA)

Traction is strictly contraindicated in Type IIA fractures



Type IIA fractures are highly unstable due to oblique/horizontal fracture lines

Traction increases deformity and causes further neurological compromise

Reduction must be achieved by extension and compression via halo apparatus

Exam Pearl: Applying traction to a Type IIA fracture actively worsens the injury and can cause catastrophic iatrogenic spinal cord injury.



PG Residency

Orthopaedics Residency Program

Theory Videos, Clinical Cases, PYQs & Live Sessions

[Enrol Now →](#)



DocTutorials

Download Our App Now

[App Store](#)

[Google Play](#)

[Click Here →](#)

Operative Management & Indications



Absolute Indication:

Type III injuries (always present with facet dislocation)

Type III cannot be managed conservatively; surgery is the **ONLY** indication.

Relative Indications:

Loss of reduction or non-union in Type II or IIA

Surgical Principles:

Standard operative intervention: **Posterior C1-C3 fusion** using pedicular screws.

Anterior reduction maneuvers are highly difficult in Type III (articular process disconnected from C2 body).

Exam Pearl: Surgery is the only indication for Type III fractures due to dislocated facets and lack of continuity between C2 articular processes and the C2 body.



Orthopaedics
High-Yield Videos
Structured Syllabus Videos



[Watch Now →](#)



DocTutorials
Download Our App Now

[App Store](#)

[Google Play](#)

[Click Here →](#)

Surgical Approaches Comparison Matrix

Posterior Fusion		Anterior Fusion	
Stabilization Levels	C1-C3	Stabilization Levels	C2-C3
Advantages	Strongest construct for stabilization	Advantages	Preserves C1-C2 motion (maintains lateral rotation)
Disadvantages	Sacrifices atlantoaxial mobility (permanently locks lateral neck rotation)	Disadvantages	Less rigid/strong than posterior lateral mass fixation
Indications	Ideal for Type III. Preferred when anterior reduction is impossible	Indications	Indicated for Type II or IIA if non-op treatment fails

Exam Pearl: Posterior C1-C3 fusion provides maximum stability but permanently eliminates lateral neck rotation by locking the atlantoaxial joint.



PG Residency

Orthopaedics Residency Program

Theory Videos, Clinical Cases, PYQs & Live Sessions

Enrol Now →



DocTutorials

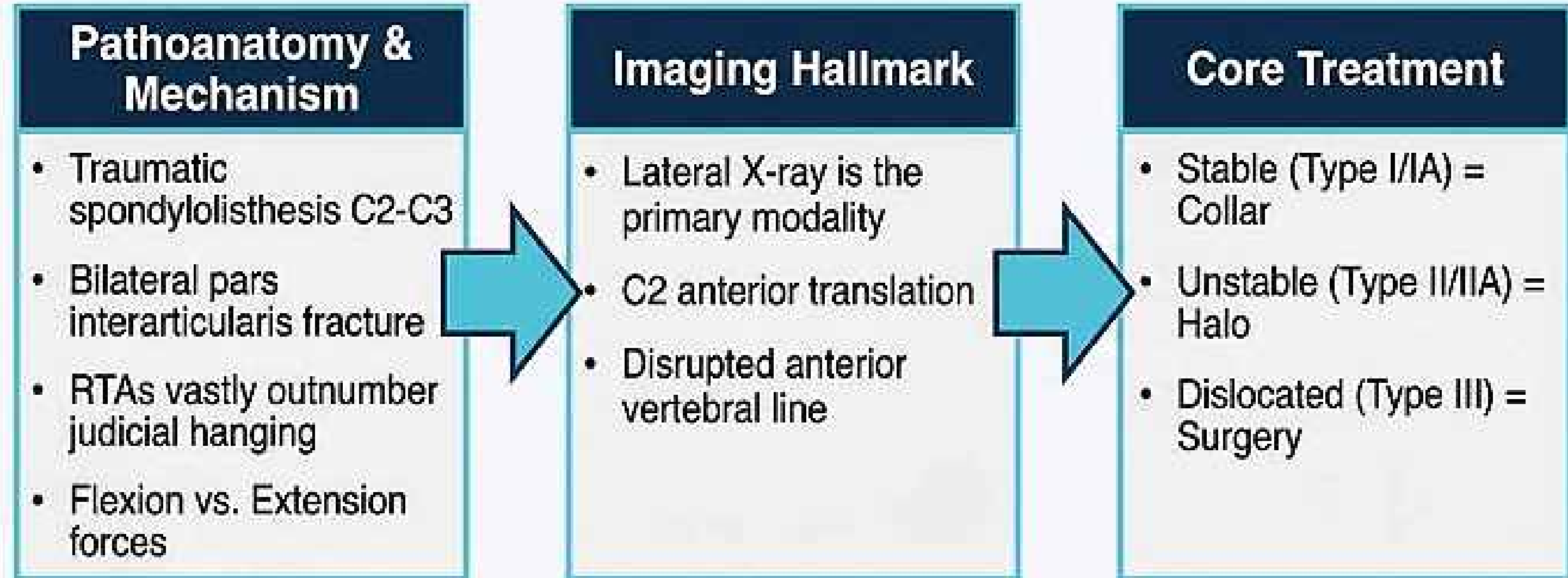
Download Our App Now

App Store

Google Play

Click Here →

Rapid Revision Summary



Exam Pearl: Always rule out concomitant cervical spine injuries and neurological deficits before committing to a conservative 6-8 week cervical collar.



Must-Remember Classifications & Values

Displacement Threshold	6-8 weeks (Standard for Type I / IA)
Displacement Threshold	3 mm (Differentiates Type I from Type II)
Collar Duration	6 to 8 weeks (Standard for Type I / IA)
Type II Definition	>3mm translation + significant angular deviation
Type III Definition	Pars fracture + C2-C3 facet dislocation
Type IA Risk	High neurological deficit risk despite <3mm displacement

Exam Pearl:

In the Star & Eismont modification, the physical continuity of the posterior C2 body with the pars fragment is what drives the dangerous canal compression in Type IA.



PG Residency

Orthopaedics Residency Program

Theory Videos, Clinical Cases, PYQs & Live Sessions

Enrol Now →



DocTutorials

Download Our App Now

App Store

Google Play

Click Here →

Common Exam Traps



The Trap

Assuming "Hangman's" implies a hanging mechanism.

Clinical Reality

RTAs are the most common cause.



The Trap

Applying traction to all unstable fractures.

Clinical Reality

Traction is strictly contraindicated in **Type IIA**.



The Trap

Assuming all <3mm displacements are benign.

Clinical Reality

Type IA carries a **high neurological deficit risk**.



The Trap

Attempting conservative management for Type III.

Clinical Reality

Facet dislocation mandates **immediate surgery**.

Exam Pearl: Traction reduces Type II but distracts and worsens Type IIA. You must differentiate these on lateral X-ray before applying any forces.



Orthopaedics

High-Yield Videos

Structured Syllabus Videos



Watch Now →



DocTutorials

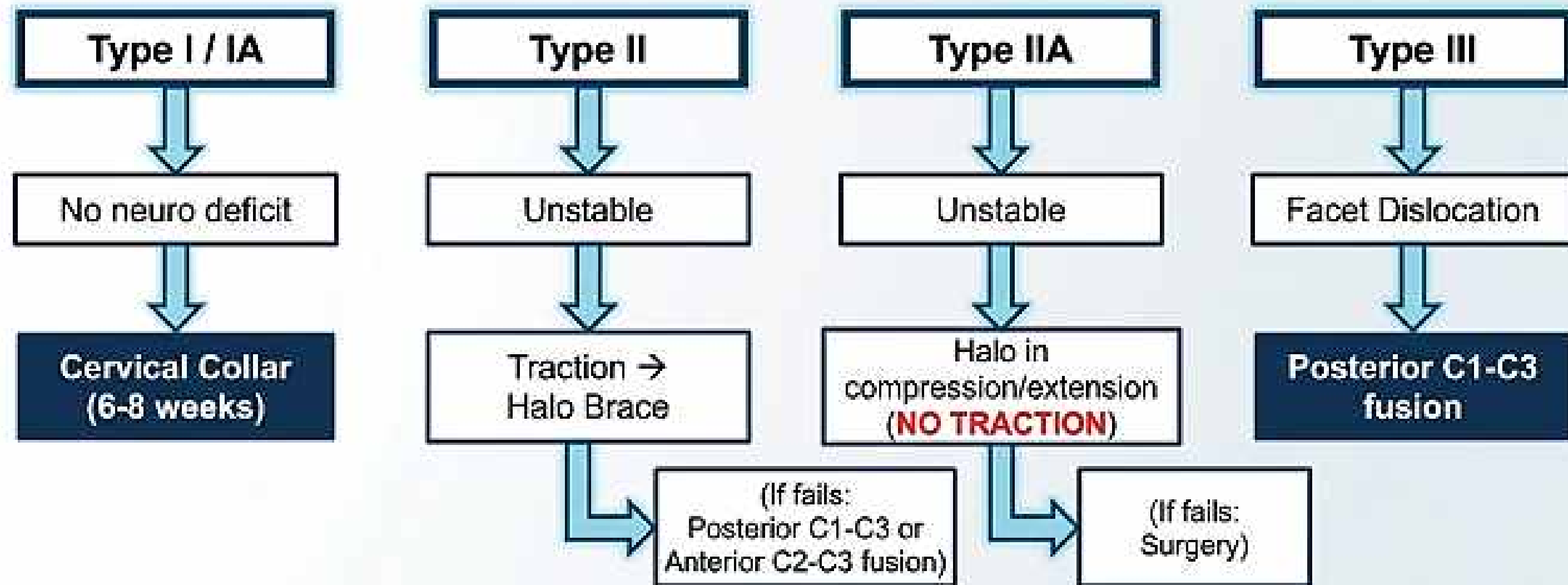
Download Our App Now



Google Play

Click Here →

One-Page Management Algorithm



Exam Pearl: Failure of Halo immobilization (loss of reduction or non-union) in Types II and IIA upgrades the management directly to surgical fusion.



PG Residency

Orthopaedics Residency Program

Theory Videos, Clinical Cases, PYQs & Live Sessions

[Enrol Now →](#)



DocTutorials

**Download Our
App Now**

[App Store](#)

[Google Play](#)

[Click Here →](#)

Final Take-Home Messages

- ✓ Hangman's fracture is defined as a bilateral pars interarticularis disruption causing C2-C3 spondylolisthesis.
- ✓ Thorough neurological assessment is critical, particularly for the Type IA variant injury.
- ✓ Levin & Edwards classification strictly dictates the progression between orthosis, halo, and surgery based on a 3mm threshold and facet integrity.
- ✓ Preservation of atlantoaxial lateral rotation is the primary biomechanical advantage of anterior C2-C3 fusion over posterior C1-C3 fusion.

Exam Pearl: Mastery of the biomechanical distinction between Type II and Type IIA prevents catastrophic iatrogenic injury during attempted reduction maneuvers.



PG Residency + NEET SS 2 + 1 Combo **NEW**

One Plan. Two Goals. Your Best Future.

Designed for PG Residents preparing for
both **PG Residency & NEET SS.**



FREE Access
in PG Year 1



Pay Only for
PG Year 2 & Year 3



Lock
Today's Price



Structured
Learning

Subject-wise &
Systematic



Consistent
Practice

High-yield QBank +
Regular Tests



Smart Revision
& Recall

Revision Notes +
Memory Boosters



2 Goals. 1 Plan.

Finish Strong in PG Residency.
Crack **NEET SS.**

[Subscribe Now](#)

