

## RHEUMATOID SPINE

Involvement of the spine is common in rheumatoid. Incidence been reported to be 85% radiologically but only 30% have neurological signs and symptoms.

When neurology is present it may manifest as a Radiculopathy or Myelopathy.

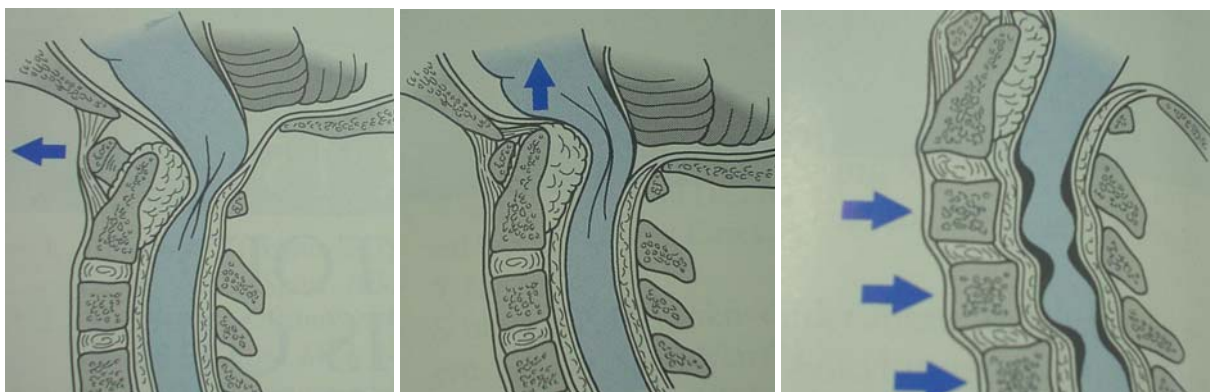
The common presentation is suboccipital headache due to irritation of second cervical nerve root by AAI [Atlanto-axial instability].

### Pathophysiology

It is similar to peripheral joints. Nerve or cord compression is due to instability or mass effect due to granulation [pannus] or vascular compromise.

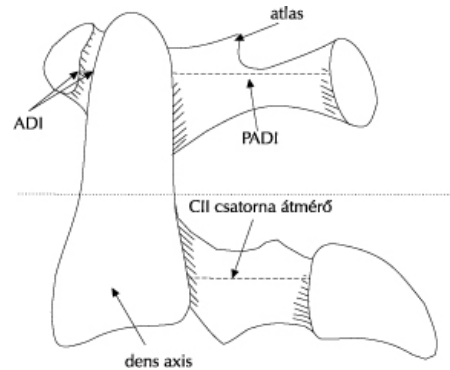
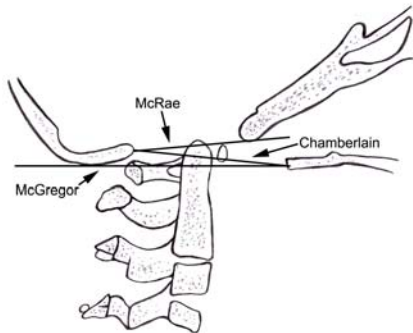
### Types

- I Atlanto-axial Instability [AAI] Commonest
  - II Basilar impression
  - III Subaxial subluxation
- All 3 can occur together



## Radiological

|                      |                                   |
|----------------------|-----------------------------------|
| AA instability [ADI] | > 5 mm                            |
| Basilar invagination | > 4.5mm above McGregor's line     |
| Subaxial instability | 3.5 mm or 11° (White and Punjabi) |



## Clinical

Early cord compression may be subtle [may present with suboccipital head ache]

A deterioration in walking ability or loss of manual dexterity of the hands.

Signs of early cord compression include hyperactive reflexes, positive Babinski and Hoffman's signs, and loss of proprioception.

In more advanced myelopathy limb weakness may be pronounced, and bladder or bowel function may be impaired.

### Ranawat classification

- I Pain, no neurologic deficit
- II weakness, hyperreflexia, Paraesthesia
- III Objective weakness, long tract signs
  - A Ambulatory
  - B Non-ambulatory

### Frankel grading

- A Complete;
- B Sensory present and Motor absent
- C Like B and some motor but useless
- D Like C but has some useful motor
- E Normal

## Assessment

1. Neurological assessment is difficult
2. High index of suspicion when a suboccipital pain is a presenting symptom.
3. Electric shock like pain on neck sudden neck flexion [Lhermitte's sign] indicate myelopathy
3. Stiffness of the neck

## Radiological

### Atlanto-axial distance [AAD]

Subluxation when distance >3 mm

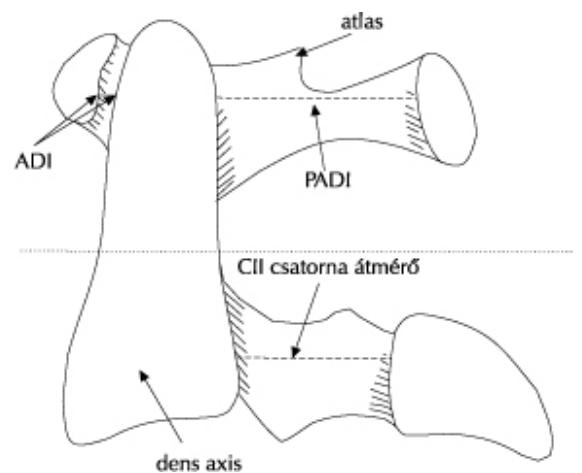
Transverse ligament is disrupted >7mm

AAD poorly correlated with neurological involvement.

### Posterior axial distance [PAD]

This distance is significant when <13 mm

Neurological recovery unlikely <10 mm



### Dynamic measurement of ADI

On flexion extension view more than 3mm is significant

### Prediction of neurology

ADI > 9 mm

AADI + Vertical settling: increase risk of compromise

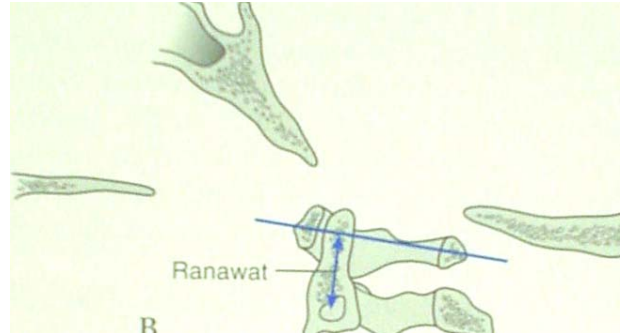
PADI <14 mm [>14: 94% neurology is intact]

PADI <10mm: poor recovery after surgery

### Ranawat distance AA

Perpendicular distance between axis and atlas

Normal: 15mm



### 3 lines

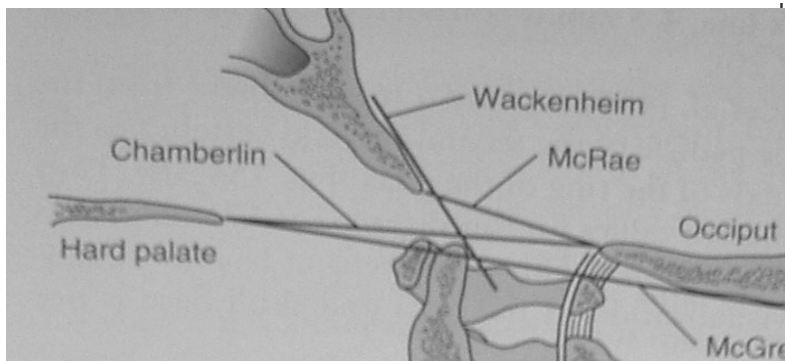
Macrae line: At the Foramen magnum

Chamberlain line Hard Palate to Posterior margin of the magnum

McGregor line Hard palate to the prominent Occiput

Lines are difficult: difficult to visualise hardpalate.

McGregor is commonly used





## Treatment

1. With early aggressive medical management of rheumatoid, the incidence of rheumatoid neck is decreasing.
2. Orthotics are poorly tolerated in this group.
3. To avoid iatrogenic neural damage, a flexion-extension lateral views are indicated in all rheumatoid arthritis undergoing limb surgeries, more so when they complain of neck pain.
4. When general anaesthesia is required with suspected neck problem, use fibro-optic for intubation.
5. The indications for surgical stabilisation in asymptomatic cervical spine involvement remain controversial.
6. Stabilisation of the cervical spine is indicated in subjects with symptomatic instability including occipital pain, and with evidence of long tract symptoms or signs on clinical assessment.
7. Some authors advocate stabilisation when the posterior atlanto-dens interval is 14mm and others advocate surgery based solely on clinical findings of symptoms with or without neurological deficit, independent of the radiological features.

## I AAI

Asymptomatic    Observe

                          Surgery is controversial

                          When poor predictors: surgery can be recommended

Symptomatic    Stabilize the spine

                          When closed reduction of AA is possible: Gallis surgery is fine

                          When no reduction AA is possible, a laminectomy of C1 and C0-C2 fusion

                          When neurology is present, a decompression is required in addition to stabilization

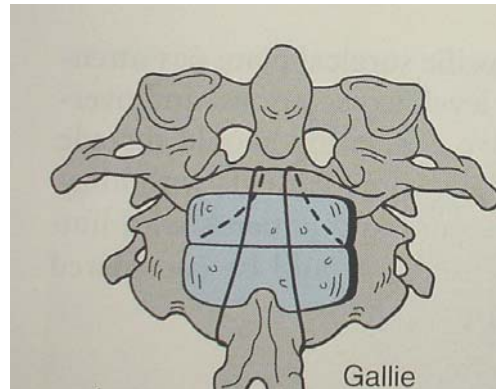
But if persistent neurology after surgery, an anterior trans-oral decompression of odontoid is required

### Gallies Wiring C1-2

Is a simple procedure

Sublaminar wiring around atlas and around the Spinous process of the axis

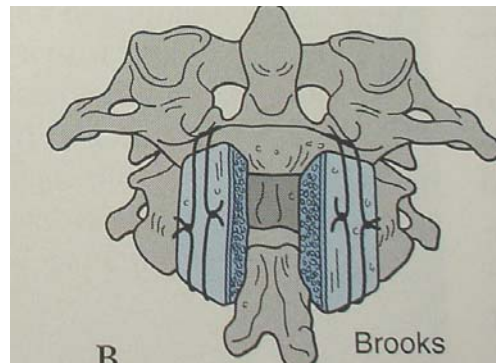
Bone grafting



### Brooks wiring

Sublaminar wiring of Atlas and axis

Bone grafting



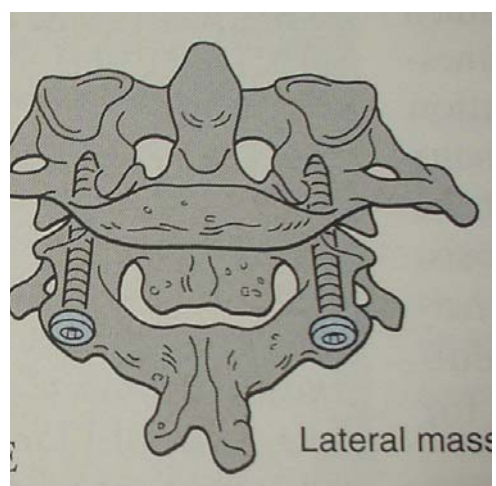
### Magerl technique

Should not be performed when there is no reduction of atlas and axis

Cannulated screw fixation from C1-C2.

Fusion: 95%

Vertebral artery can be damaged

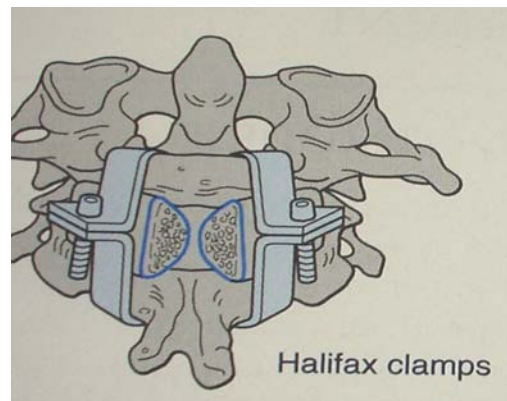


## Halifax clamps

Interlaminar clamp

Pseudarthrosis: 20%

Not commonly used



## Brooks Technique

Patient prone and tongs traction [traction not required]

Verify the position of atlas and axis under image intensifier

Midline posterior approach

Identify ring of the atlas and strip 1.5 cm either side

Expose the C2 and C3

Strip the Ligamentum flavum from the cranial end of axis and the caudal edges of the lamina of the atlas with a curved curette

Now pass 4 tricon sublaminar: and then rail road the Songer cable 2 pairs passed on each side

Decorticate the posterior element with a burr

Iliac corticocancellous graft is used

Now graft is tied down to the lamina



## II Basilar invagination

May present with neurology

X ray odontoid at the jugular foramen

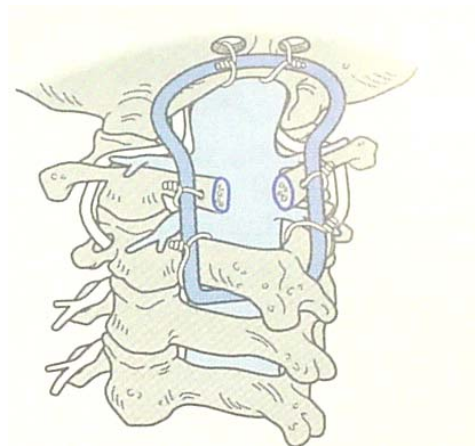
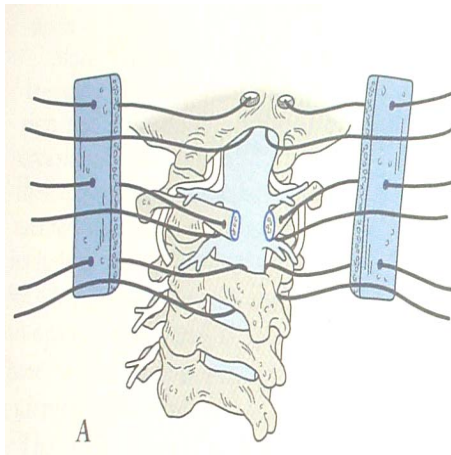
MRI Abnormal cord signal;

135° angle of odontoid with cord]

Rx: C0-C2 fusion [Occipitocervical arthrodesis]

[Clarks or Ransford loop]

+ Laminectomy or excision of odontoid



### III Subaxial instability

Involved in 20%

More common in males, steroid use, severe RA

Joint of Lushka and facet joint involvement

Multiple level subluxation

MRI: < 13 mm canal diameter with subluxation > 4mm

Treatment

Posterior fusion +/- laminectomy

[when Myelopathy is present]

Pain relief: 90%

Neurology recovery:

Class II: 80% recovery

Class III: 40% recovery

PADI : <10 mm: poor neurological recovery

Complications

1. Death 5-10%
2. Pseudarthrosis: 20%
3. Wound problem: 10%
4. Late subaxial subluxation





