SUMMARY, CONCLUSION AND RECOMMENDATIONS

Assessment of cervical spine instability is one of the challenging issues on radiology. An unstable lesion was simply defined as one in which further displacement may occur with normal movements causing or aggravating a neural deficit.

Between December 1997 and January 2000, 70 cases, aged between 3 and 76 year, including 54 male and 16 females were selected and subjected to examination by different radiological modalities.

It is found that trauma was the commonest cause of instability responsible for the presentation of 74.3% of cases.

Motor vehicle accidents was found to be the commonest cause of trauma responsible for 68.0% of cases. Hyperflexion was the commonest mechanism of injury accounting for 32.0% of cases. C2 was the commonest level affected recorded in 18.7% of cases.

Lower cervical instability (C3-C7) was also more common than upper instability (C0-C2).

Fracture dislocation was the commonest cause of lower cervical instability, while dens fracture was the most frequent injury leading to upper instability.

Non-traumatic causes of instability were the minority. Neoplasms was on top of the list of non-traumatic lesions causing instability; representing 35.0% of cases. Plain radiography is still the front line of examination and considered the best screening method of the cervical spine particularly in cases of cervical injuries.

The three-view examination is probably sufficient in most instances to evaluate the unstable cervical spine. Flexion and extension radiographs are mostly indicated in patients with neck pain and no evidence of injury on the initial examination.

Conventional tomography is useful for imaging of long segments of the cervical spine and undisplaced fractures of the dens and facets. The use of tomography has been largely replaced by CT.

CT is the most valuable modality in assessment of bony injuries or lesions. It is more sensitive than other imaging modalities in detection of fractures particularly those of the posterior neural elements. CT is also more sensitive in detection of atlanto-axial instability than plain radiography; otherwise dislocations and subluxations are better detected by the latter. CT is also more valuable than other imaging modalities in detection of bony erosions in cases of rheumatoid arthritis.

MRI is the examination of choice of instability with a likelihood spinal cord involvement. It is the only modality that can demonstrate the intramedullary lesions directly. MRI is more sensitive than CT in evaluation of soft tissue lesions, disc herniation, ligamentous injuries and facetal mal-alignment. However, it is less valuable than CT in detection

of intraspinal bone fragments and osteoarthritic changes associated with cases of degenerative instability.

Kinematic MRI is a new useful modality in evaluation of borderline cases. It is superior than dynamic radiographs (flexion and extension views) in direct demonstration of the ligamentous configuration and strength, however due to its relatively high cost, it cannot be used as a screening method for patients susceptable to delayed instability.

In fact, the different imaging modalities should be complementary to each other in diagnosis of cervical spine instability and the selection of one modality or other will be governed by the patient's clinical condition as well as the availability of the modality of choice.

Because trauma is the commonest cause of instability and because of the wide variety of imaging techniques available, it is desirable to conclude a radiological approach and to decide an imaging scenario for assessment of the cervical spine instability in trauma patients. An algorithm for several clinical circumstances is recommended here (Modified from ***Mark et al., 1999)*** (Figures 20 and 21).