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Case # 1 - Anatomy of a Whiplash Injury

Presentation: A 45 year-old male is referred to you for examination. He was in a car accident a few weeks ago. His car was stopped for a red light when another vehicle hit his car from behind. There was not a lot of damage to the vehicle and he seemed to have suffered little in the way of injuries. A few days later he complained of headaches and severe neck pain. On examination, you find the posterior neck to be tender. The patient can move his neck in all directions. However, neck extension is limited and painful. The patient can chew without difficulty, is able to swallow and stick his tongue out straight, indicating that there was no cranial nerve involvement. He also had no upper limb pain nor was there any loss of upper limb motion.

Activities:

- I. Define what is meant by a "whiplash injury".
- II. Demonstrate the following to your colleagues:
 - The arrangement of the cervical vertebrae.
(Review the anatomy of C1, C2 and C7 vertebrae)
 - Discuss the shape of the zygapophyseal joints between cervical vertebrae.
 - Provide the relationship between joint shape and movements of the neck.
 - Review the structure and function of the atlantooccipital and atlantoaxial joints.
- III. Demonstrate the major attachments and actions of the muscles acting on the head and the neck.
 - Indicate which muscles are involved with producing the main motions that occur in the neck.
 - Indicate the actions of the muscles involved in moving the head on the neck.
- IV. Review the attachments and function(s) of the ligaments that support the cervical vertebrae.
 - Include in your discussions which ones might be injured in this type of accident.
 - Include in your demonstration the structures involved in providing support for the sub-occipital joints.
- V. Discuss the mechanism for producing a "whiplash" type injury.
 - What structures are likely to be damaged?
 - What are the sources of pain?