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## Manifestations of rheumatoid arthritis: epidural pannus and atlantoaxial subluxation resulting in basilar invagination.

Adam L Schreiber, DO, MA  
*Thomas Jefferson University*

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**Manifestations of Rheumatoid Arthritis: Epidural  
Pannus and Atlantoaxial Subluxation Resulting in  
Basilar Invagination**

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Adam L. Schreiber, DO, MA

Atlantoaxial instability results from cartilaginous destruction, periarticular erosions, and ligament and tendon attenuation. Instability affects 19%-70% of patients, and basilar invagination from vertical odontoid subluxation through the foramen magnum occurs in 38% of patients. This phenomenon occurs twice as often in women than men, whose age at diagnosis typically ranges from 30-50 years. Along with bony compression, the pannus further decreases the space available for the cord by 3mm or more in approximately 66% of patients (Figures 1-7). The earliest and most common symptom of cervical subluxation is pain radiating up into the occiput with associated headaches. Episodes of medullary dysfunction that represent severe but less common patterns of progressive myelopathic symptoms provide an even more grim prognosis. When cervical myelopathy is established, 50% of these patients die within 1 year.

The incidence of sudden death from the combination of basilar impression and atlantoaxial instability is 10%. Preoperative neurological deficits provide a guarded prognosis, and basilar impression is associated with poorer recovery of function [1,2]. McRorie et al [3] researched surgical outcomes and found that no clear factors emerged to predict the greatest risk of operative mortality. Neurological compromise did not correlate with immediate perioperative death, and early surgery to correct symptomatic atlantoaxial subluxation may prevent the progression of instability.

**A.L.S.** Department of Rehabilitation Medicine, Jefferson Medical College of Thomas Jefferson University, Philadelphia, PA.

Address correspondence to: A.L.S.,  
Jefferson Medical College of Thomas Jefferson University,  
25 S 9<sup>th</sup> Street  
Philadelphia, PA 19107  
e-mail:schreiberdo@yahoo.com

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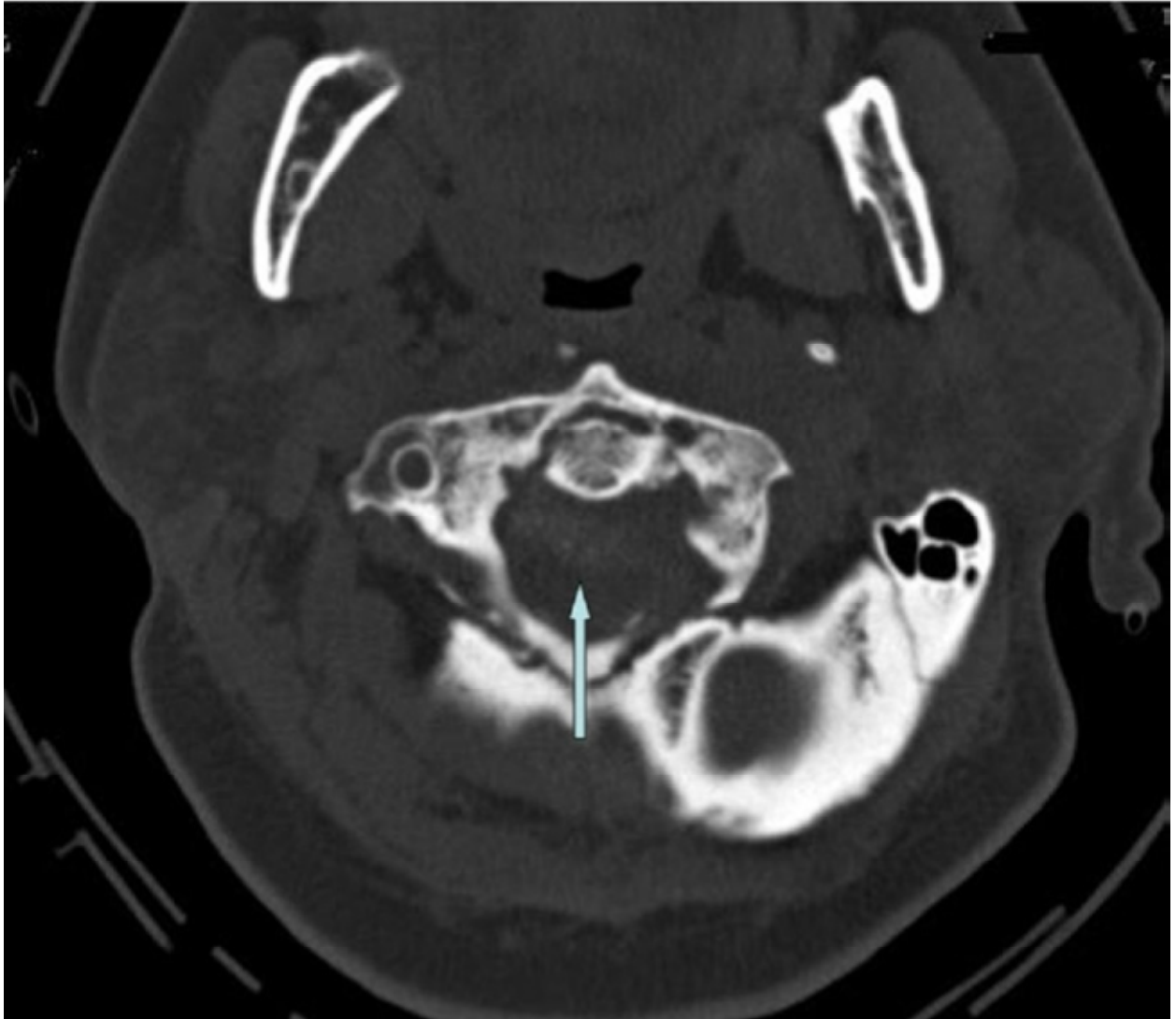
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**Figure 1.** A cervical spine sagittal computed tomography scan reveals pannus formation (right arrows) and superior odontoid migration causing basilar invagination (left arrow). (Scan was performed with a Philips Brilliance 64 computed tomography scanner with 0.9-mm slices).



**Figure 2.** A cervical spine axial computed tomography scan at the C2 level reveals pannus formation within the central canal causing canal stenosis (arrow). (Scan was performed with a Philips Brilliance 64 computed tomography scanner with 0.9-mm slices.)



**Figure 3.** A cervical spine coronal computed tomography scan reveals superior odontoid migration with C1-C2 erosions (left and right arrows). (Scan was performed with a Philips Brilliance 64 computed tomography scanner with 0.9-mm slices.)



**Figure 4.** A cervical spine sagittal T2-weighted magnetic resonance imaging scan reveals pannus formation (left arrow) causing spinal canal stenosis and T2 hyperintensity within the spinal cord (right arrow). (Scan was performed with a Philips 1 Tesla Panorama magnetic resonance imaging unit with 3-mm/1-mm skip.)

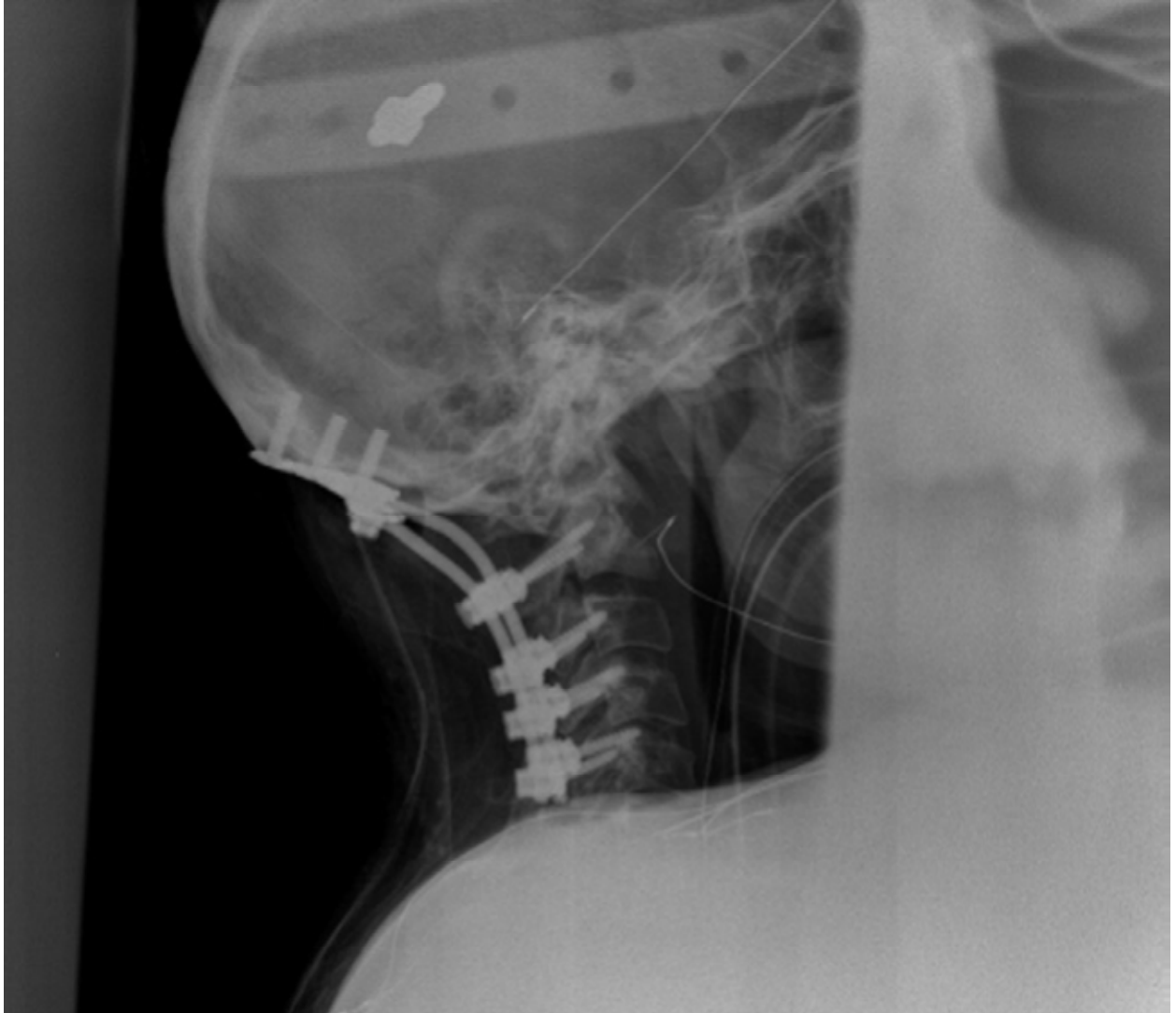


**Figure 5.** A cervical spine sagittal T1-weighted magnetic resonance imaging scan reveals pannus (left arrow) causing canal stenosis and spinal cord compression (right arrow). (Scan was performed with a Philips 1 Tesla Panorama magnetic resonance imaging unit with 3-mm/1-mm skip.)





**Figure 6.** A lateral cervical radiograph shows odontoid process within the foramen magnum after cranial settling causing basilar invagination (right arrow).



**Figure 7.** A lateral cervical radiograph shows posterior fixation from the occiput to C5.

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