

10. ULUSAL
ACİL TIP KONGRESİ
15 - 18 Mayıs 2014
Gloria Golf Resort Hotel,
Belek-Antalya



Servikal Grafi

Murat DURUSU

GATA - Ankara

Sunum planı

- ▶ Servikal grafi nasıl değerlendirilir ?
- ▶ Önemli patolojiler !
- ▶ Zor farkedilenler/kolay atlananlar !
- ▶ Öneriler !

Grafler...

- ▶ Lateral Grafi (% 85)
- ▶ Antero-Posterior (A-P) Grafi (~%1-2)
- ▶ Odontoid Grafi (%15)
- ▶ Oblik Grafler
- ▶ Dinamik Grafler

Radyografinin analizi (ABC'S)

- ▶ **Adequacy (uygunluk)**
- ▶ **Alignment (hatlar)**
- ▶ Anterior atlantodental interval
 - ▶ Basion-dental interval
 - ▶ Base of dens
 - ▶ **Bones**
 - ▶ **Cartilaginous disks**
 - ▶ Cartilage of interfacetal joints
 - ▶ Connective tissue
 - ▶ **Soft tissue**
 - ▶ Scan of periphery
 - ▶ Selective reexamination

Lateral grafi

A. Lateral view



B. Radiograph of cervical vertebrae, lateral view

Occipital bone

Anterior arch
of atlas (C1)

Posterior arch
of atlas (C1)

Intervertebral disc

Zygapophyseal joint

Intervertebral foramen

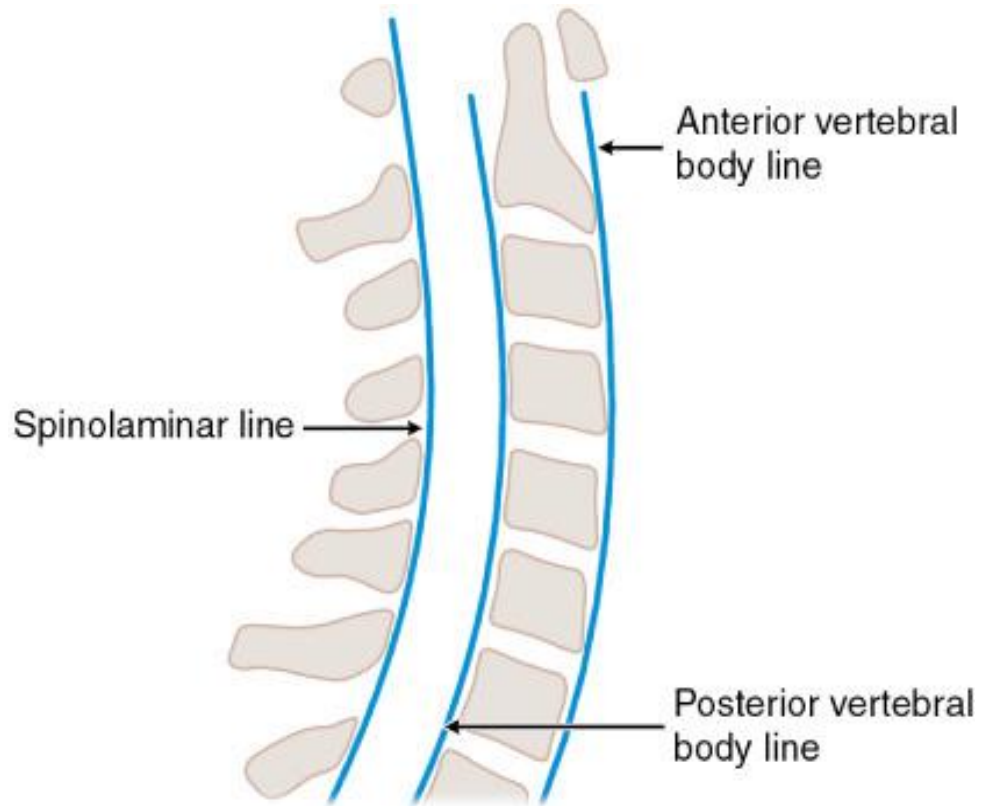
Spinous process of C6

Transverse process



- C1-C7 görülmeli, tam lateral olmalı

Lateral servikal grafi



Alignment (hatlar)

- ▶ Anterior spinal hat
- ▶ Posterior spinal hat
- ▶ Spinolaminar hat

Source: Simon RR, Sherman SC: *Emergency Orthopedics, 6th Edition*:
www.accessemergencymedicine.com

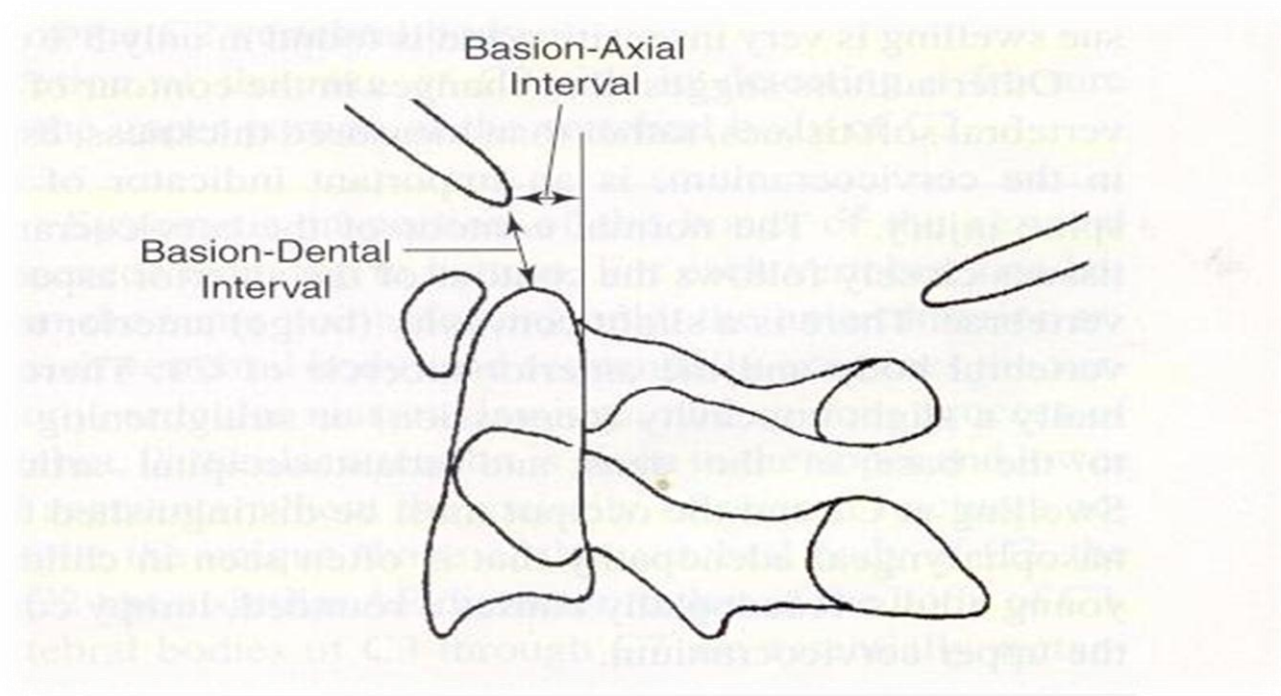
Copyright © The McGraw-Hill Companies, Inc. All rights reserved.

Lateral servikal grafi



- ▶ 11°den daha fazla açılanma...

Lateral servikal grafi

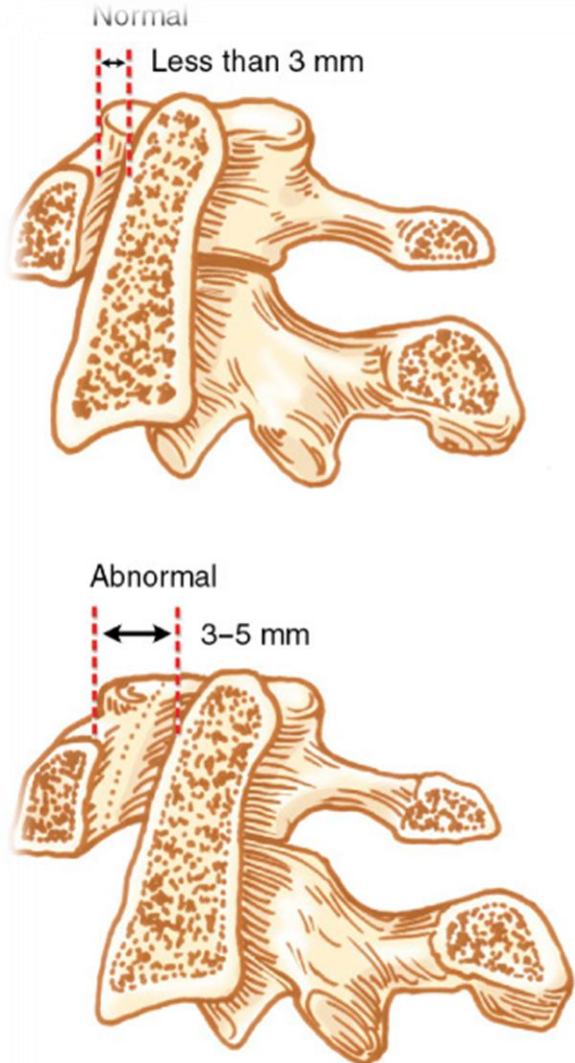


Basio-dental aralık $> 12 \text{ mm}$

*oksipitoatlantal
dissosiasyon*

(13 yaş altında **Basio-axial aralık** kullanılır ve 12 mm'den az olmalıdır)

Lateral servikal grafi



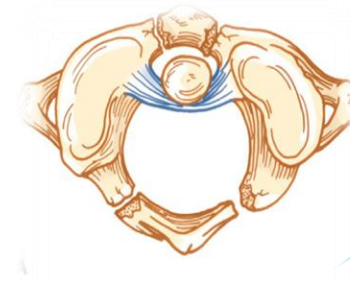
B

Fig.5-6: Normal anterior atlanto-odontoid space. A. The normal space between the anterior part of C1 and the odontoid process is less than 3 mm (empty arrow). B. Magnified lateral radiograph of the cervical spine showing abnormal increased space (5 mm) between the anterior part of C1 and the odontoid process (arrow heads).

► Anterior antanto-dental aralık

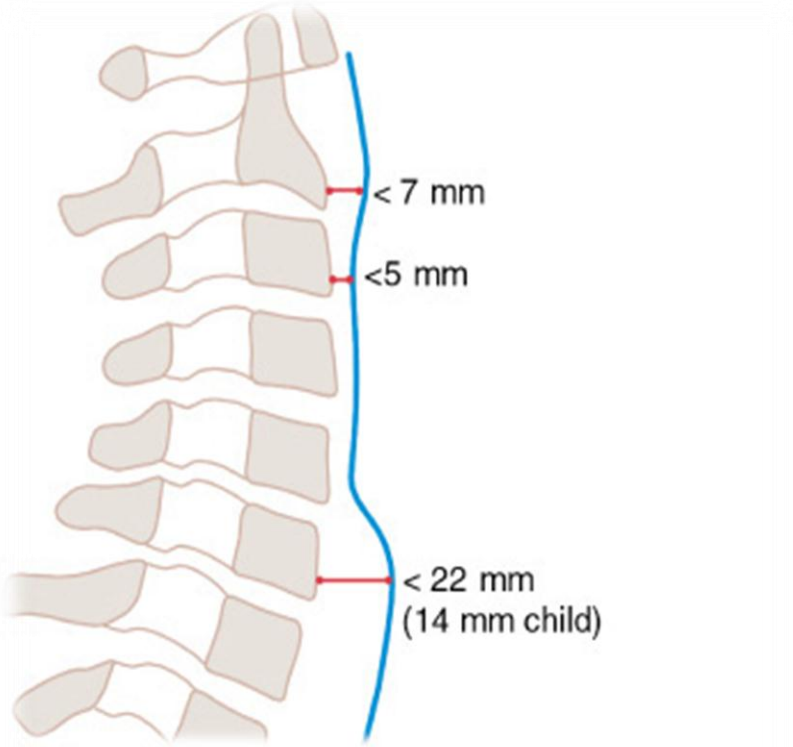
veya

► Predental aralık



Source: Simon RR, Sherman SC: *Emergency Orthopedics*, 6th Edition: www.accessemergencymedicine.com

Lateral servikal grafi



Source: Simon RR, Sherman SC: *Emergency Orthopedics, 6th Edition*
www.accessemergencymedicine.com

Copyright © The McGraw-Hill Companies, Inc. All rights reserved.

► Prevertebral yumuşak doku...

A-P servikal grafi

C. Posterior view

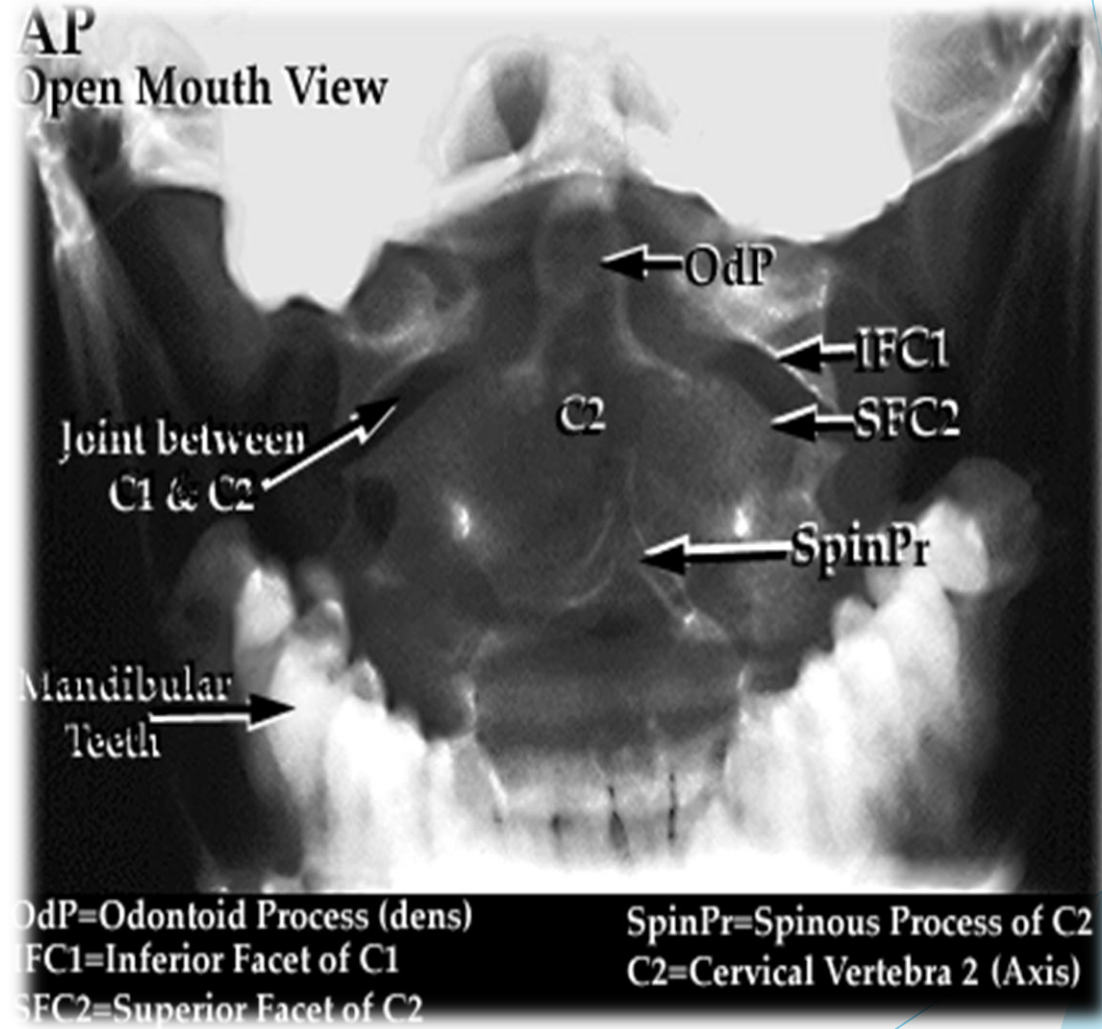


D. Radiograph of cervical vertebrae, posterior view

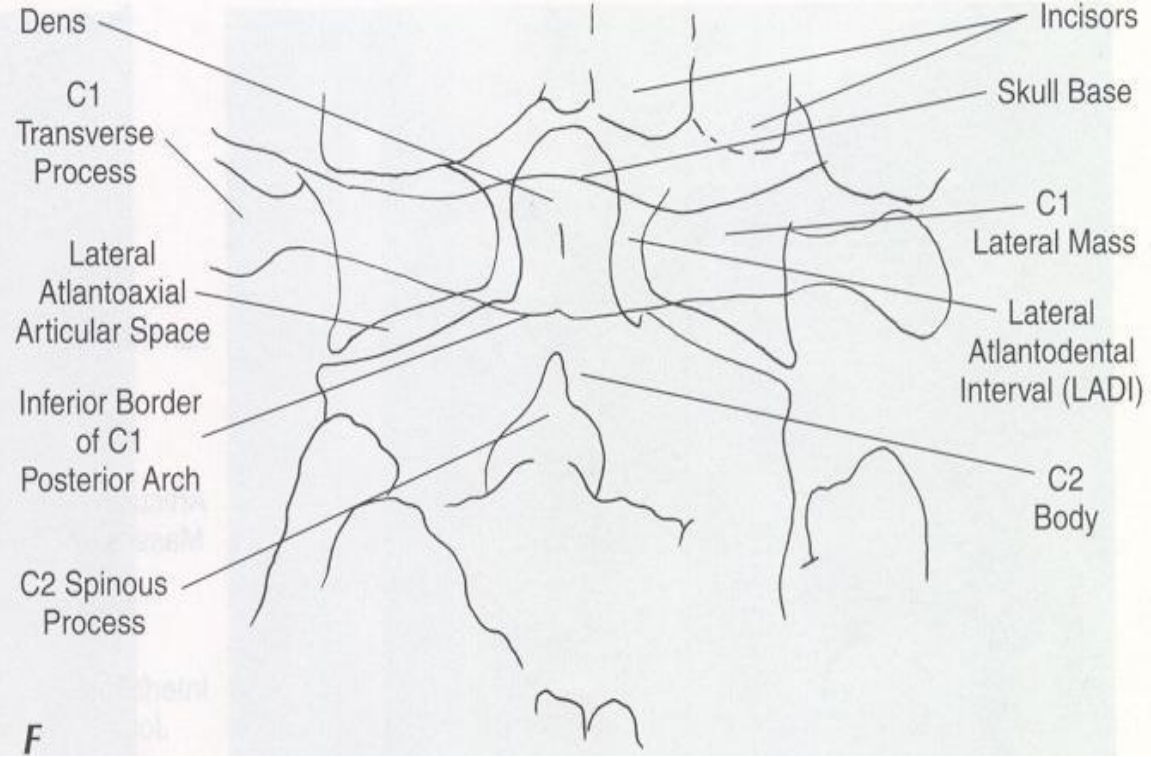
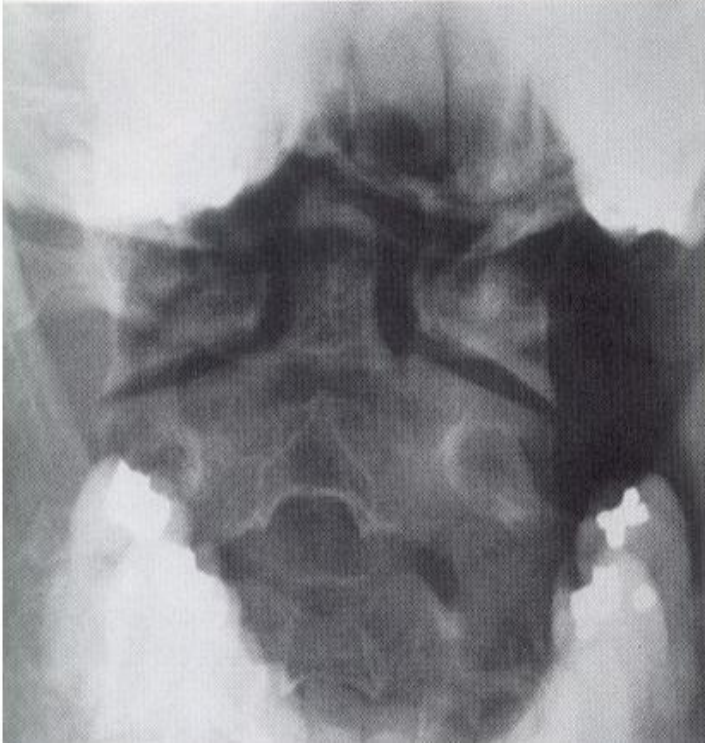


Odontoid grafi

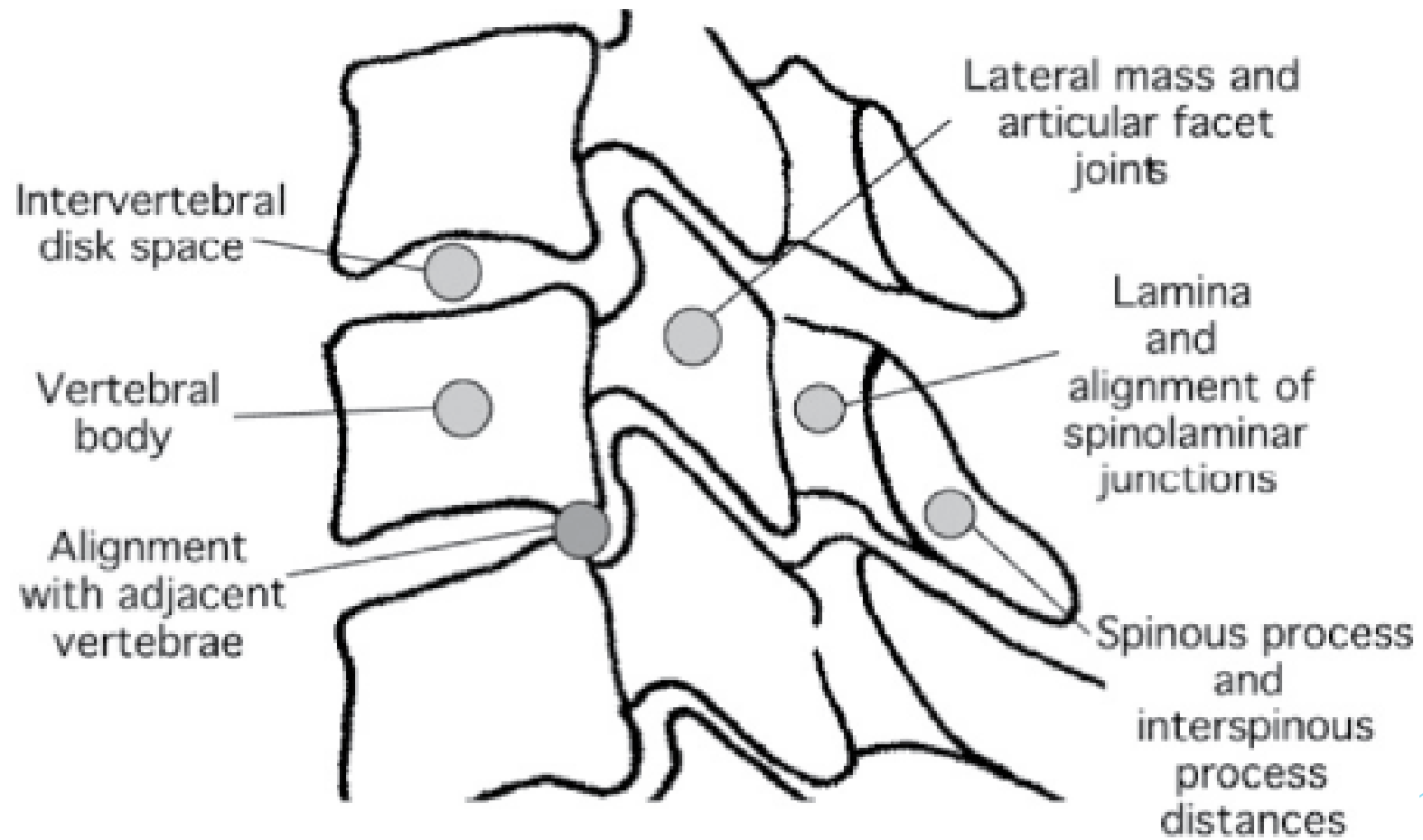
- ▶ C1 ve C2 vertebra değerlendirmesi
- ▶ Dens tabanı (**base of the dens**) en iyi şekilde Odontoid grafide görülür



Odontoid grafi



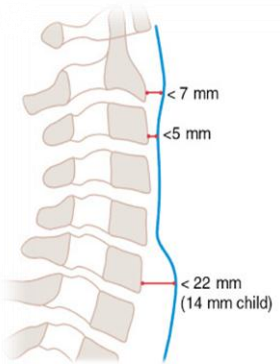
- ▶ **A (adequacy)** : dens , C1'in lateral parçaları, C2 üzerlerine diş, mandibula veya kafatası tabanı gelmeyecek şekilde net gözükmelidir
- ▶ **A (alignment)** : dens, lateral parçalar arasında simetrik şekilde olmalı, bilateral lateral atlantodental aralıklar eşit olmalı



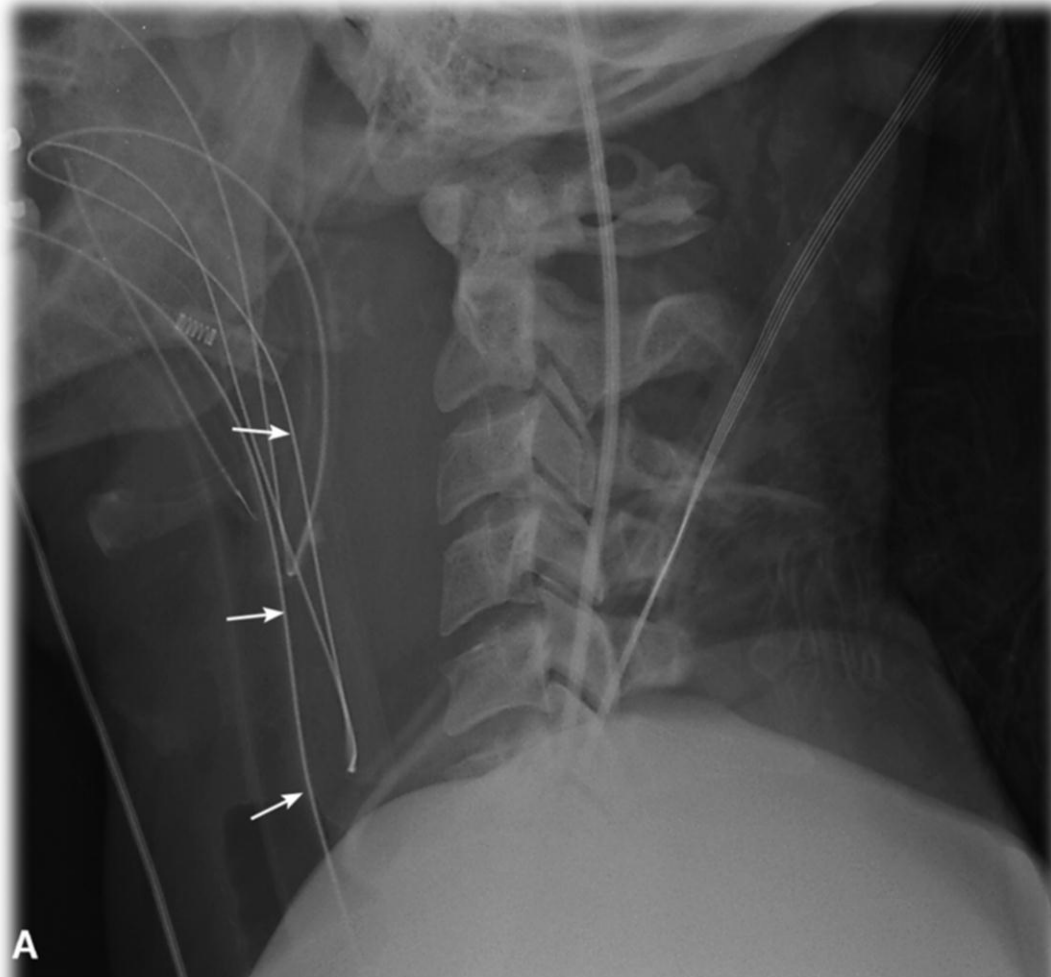


Major patolojiler

Atlanto-oksipital dislokasyon

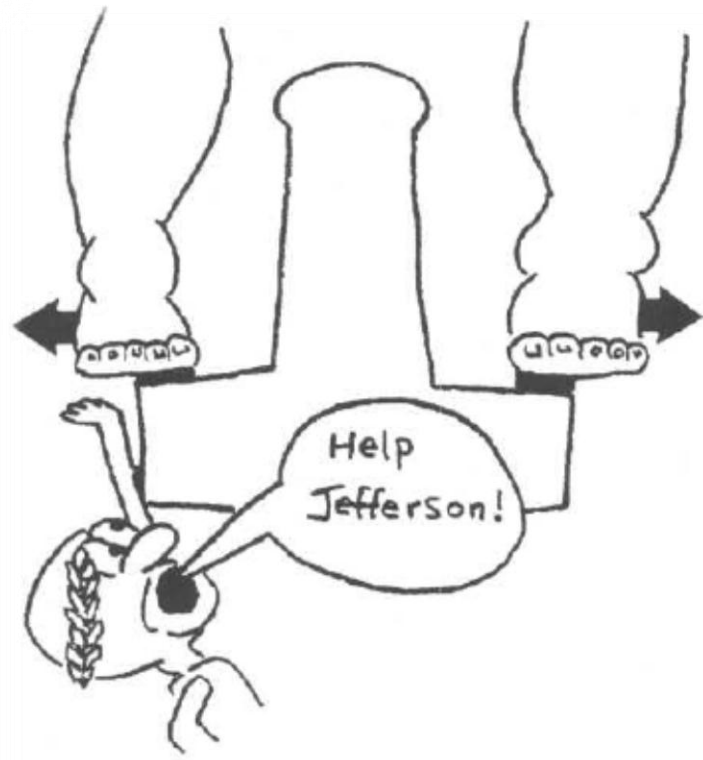


Source: Simon RR, Sherman SC: *Emergency Orthopedics*, 6th Edition. www.accessemergencymedicine.com

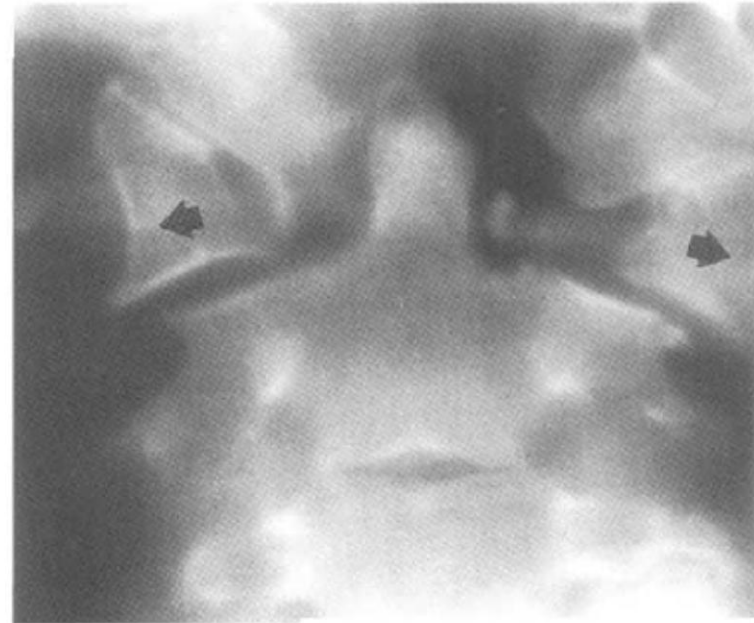
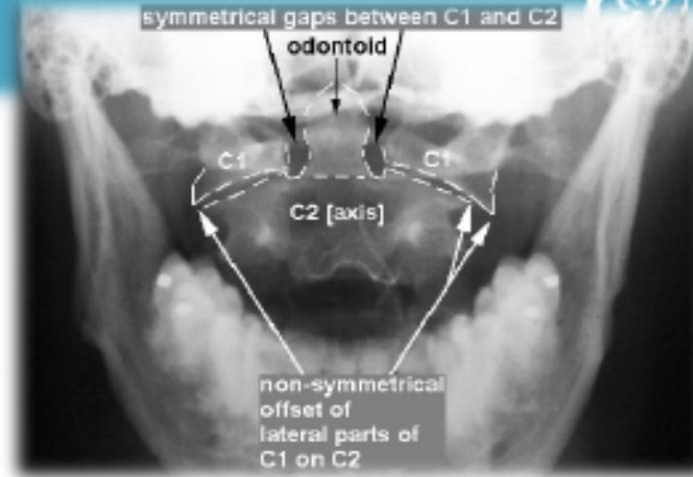


Source: Block J, Jordanov MI, Stack LB, Thurman RJ: *The Atlas of Emergency Radiology*. www.accessemergencymedicine.com

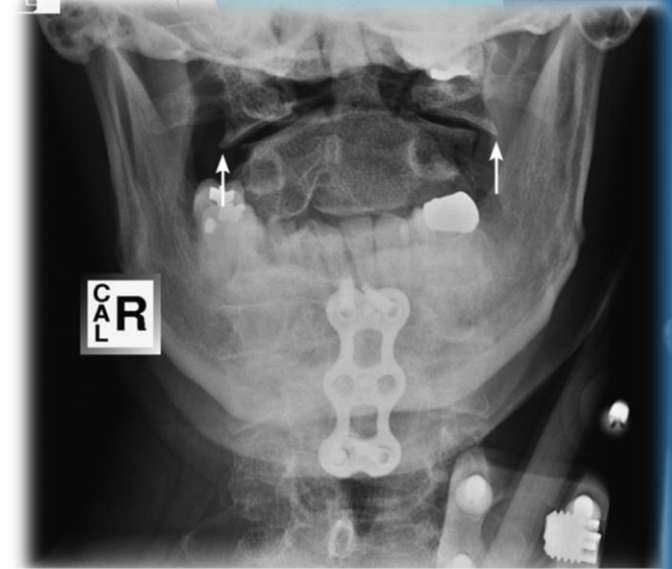
Jefferson Kırığı



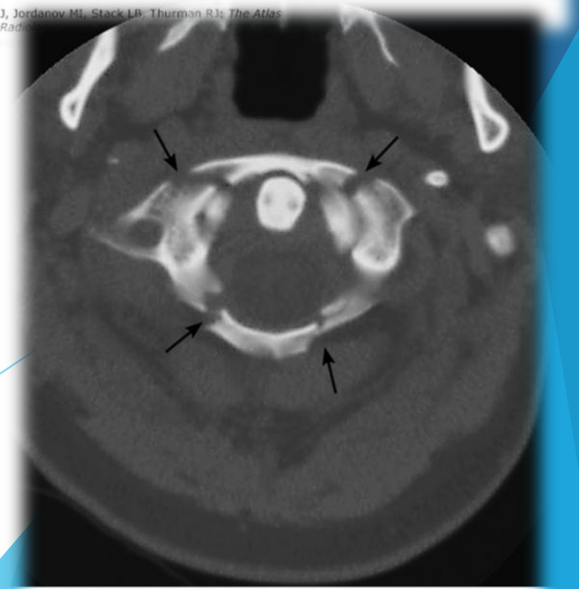
A



B



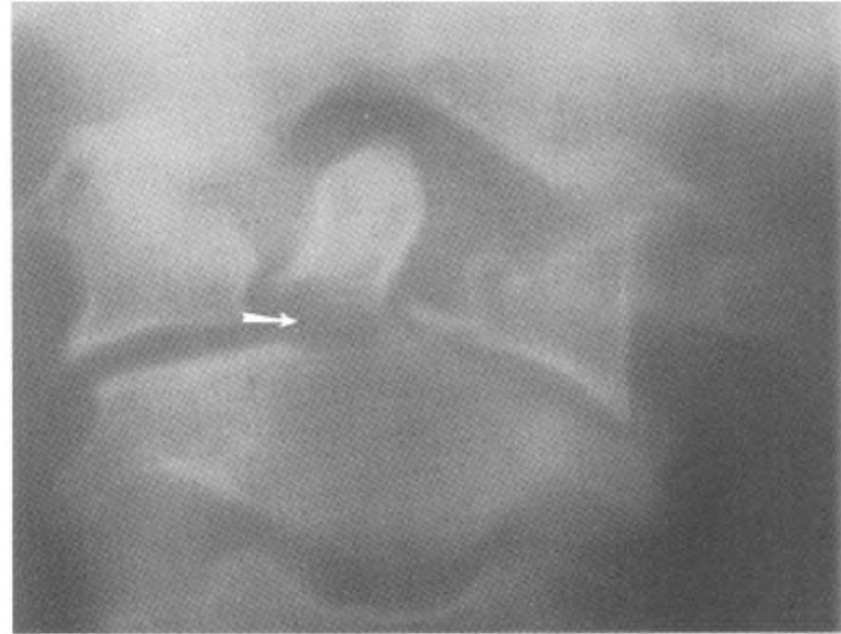
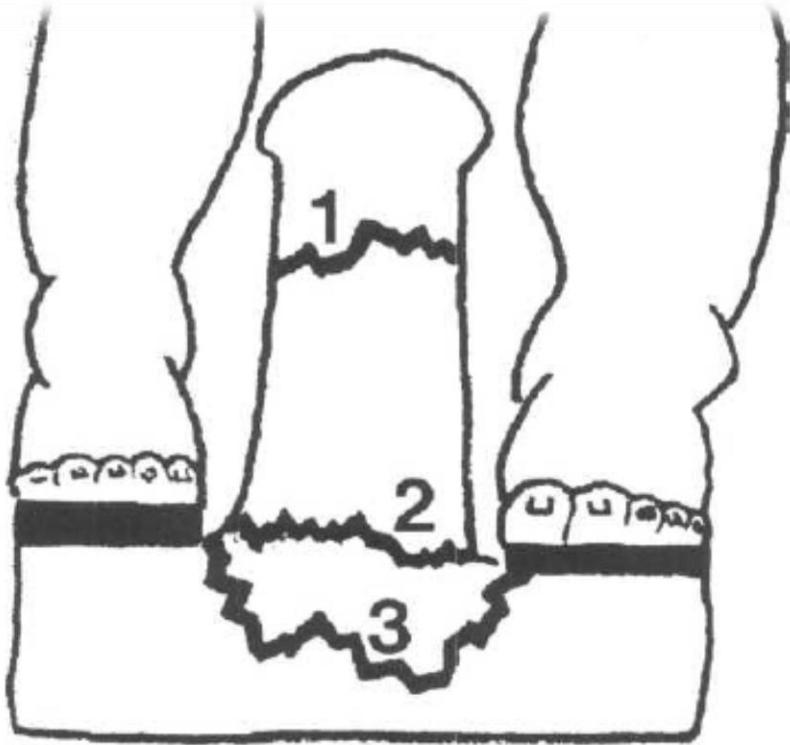
Source: Block J, Jordanov MI, Stack LB, Thurman RJ: The Atlas of Emergency Radiology, 2nd ed. Philadelphia: Elsevier; 2011.



Source: Block J, Jordanov MI, Stack LB, Thurman RJ: The Atlas of Emergency Radiology, 2nd ed. Philadelphia: Elsevier; 2011.

Fig.5-12: Jefferson's fracture. Atlas' massive feet representing the Atlas' (C1) lateral masses slip laterally and are no longer at the edges of Axis (C2).

Odontoid



A

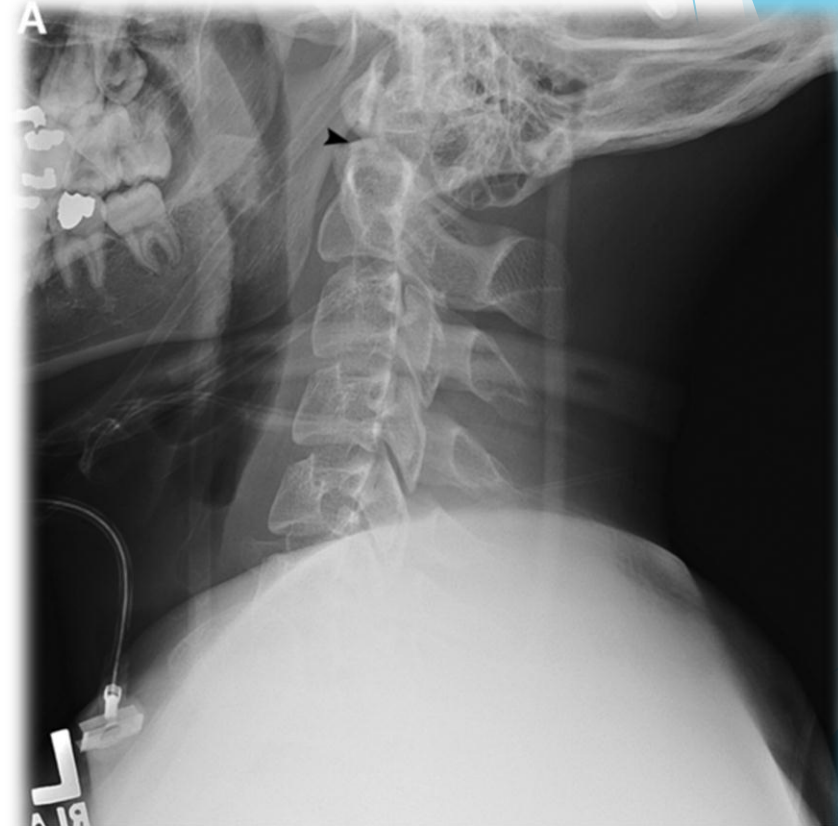
B

Fig.5-13: Odontoid fractures. A. Type 1,2,and 3 odontoid fractures. B. Open mouth radiograph showing a type 2 odontoid fracture (white arrow).

Odontoid...



Source: Block J, Jordanov MI, Stack LB, Thurman RJ: *The Atlas of Emergency Radiology*: www.accessemergencymedicine.com
Copyright © The McGraw-Hill Companies, Inc. All rights reserved.



Source: Block J, Jordanov MI, Stack LB, Thurman RJ: *The Atlas of Emergency Radiology*: www.accessemergencymedicine.com
Copyright © The McGraw-Hill Companies, Inc. All rights reserved.

Odontoid...



Source: Block J, Jordanov MI, Stack LB, Thurman RJ: *The Atlas of Emergency Radiology*: www.accessemergencymedicine.com



Source: Block J, Jordanov MI, Stack LB, Thurman RJ: *The Atlas of Emergency Radiology*: www.accessemergencymedicine.com

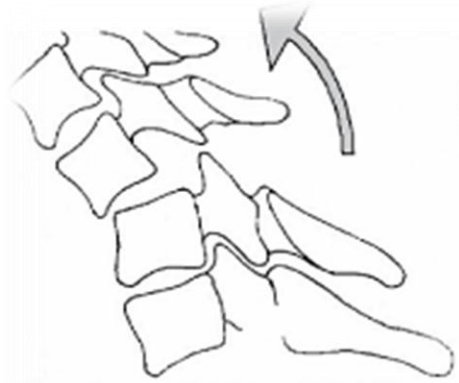
Hangman Kırığı



A Hangman's fracture.



C3-C7 kırıkları



Distractive-Flexion

Flexion sprain
Bilateral "perched" facets
Bilateral facet dislocation



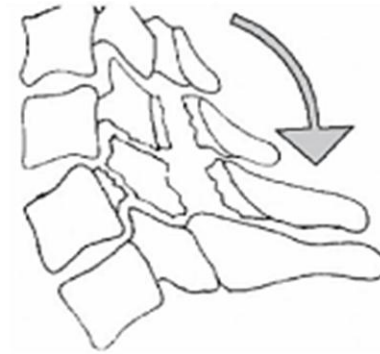
Compressive-Flexion

Wedge compression fracture
Flexion "teardrop"



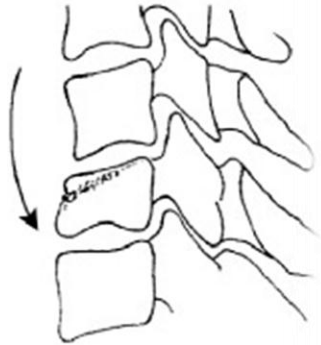
Distractive-Extension

Extension sprain
Extension "teardrop"
Extension dislocation



Compressive-Extension

Laminar fracture
Pillar fracture
Pedicolaminar fracture
Hyperextension fx-disloc

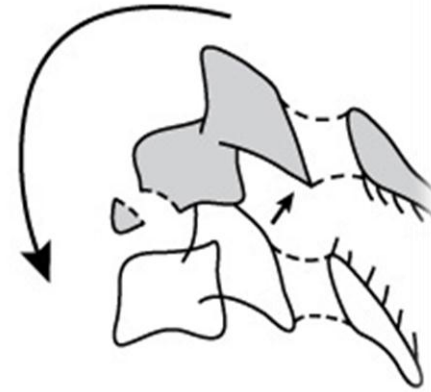


A

Source: Schwartz DT: *Emergency Radiology: Case Studies*:
<http://www.accessemergencymedicine.com>

Copyright © The McGraw-Hill Companies, Inc. All rights reserved.

Feksiyon-kompresyon

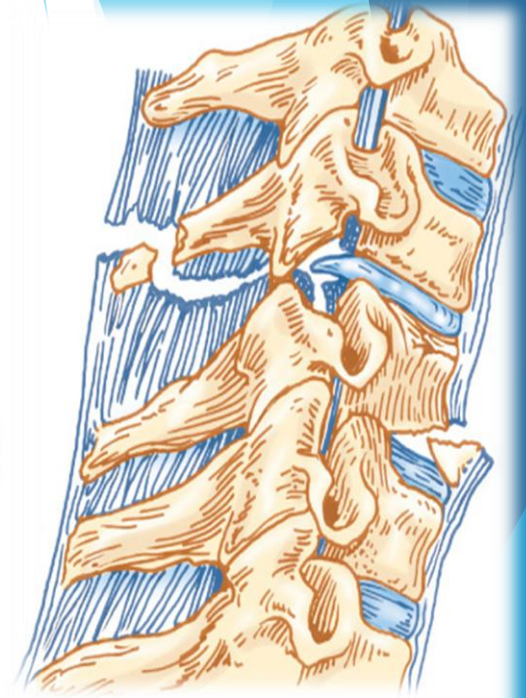


C

Source: Schwartz DT: *Emergency Radiology: Case Studies*:
<http://www.accessemergencymedicine.com>

Copyright © The McGraw-Hill Companies, Inc. All rights reserved.

Fleksiyon-teardrop

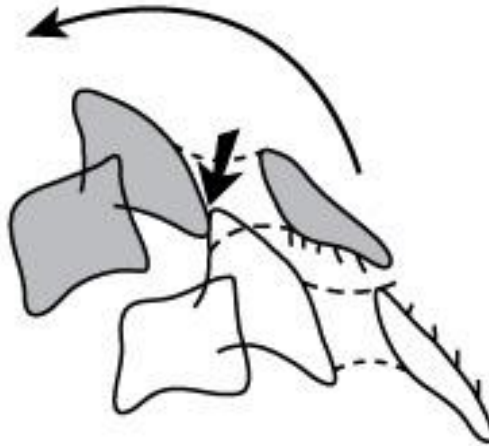


A

Source: Simon RR, Sherman SC: *Emergency Orthopedics*, 6th Edition:
www.accessemergencymedicine.com

Copyright © The McGraw-Hill Companies, Inc. All rights reserved.

Facet dislokasyonu



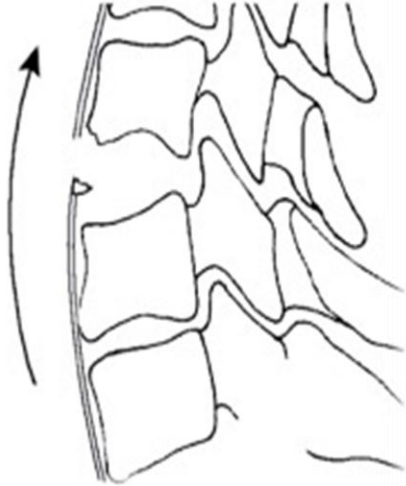
D

Source: Schwartz DT: *Emergency Radiology: Case Studies*:
<http://www.accessemergencymedicine.com>

Copyright © The McGraw-Hill Companies, Inc. All rights reserved.



Source: Block J, Jordanov MI, Stack LB, Thurman RJ: *The Atlas*
Emergency Radiology: www.accessemergencymedicine.com



Source: Schwartz DT: *Emergency Radiology: Case Studies*:
<http://www.accessemergencymedicine.com>

Copyright © The McGraw-Hill Companies, Inc. All rights reserved.

Ekstansiyon-teardrop



Source: Schwartz DT: *Emergency Radiology: Case Studies*:
<http://www.accessemergencymedicine.com>

Copyright © The McGraw-Hill Companies, Inc. All rights reserved.

Ekstansiyon-kompresyon

Clay shoveler's fracture



Source: Block J, Jordanov MI, Stack LB, Thurman RJ: *The Atlas of Emergency Radiology*: www.accessemergencymedicine.com
Copyright © The McGraw-Hill Companies, Inc. All rights reserved.

Zor farkedilenler/kolay atlanabilecekler



Source: Schwartz DT: *Emergency Radiology: Case Studies*:
<http://www.accessemergencymedicine.com>

Copyright © The McGraw-Hill Companies, Inc. All rights reserved.



Source: Schwartz DT: *Emergency Radiology: Case Studies*:
<http://www.accessemergencymedicine.com>

Copyright © The McGraw-Hill Companies, Inc. All rights reserved.



Source: Schwartz DT: *Emergency Radiology: Case Studies*:
<http://www.accessemergencymedicine.com>

Copyright © The McGraw-Hill Companies, Inc. All rights reserved.



Source: Schwartz DT: *Emergency Radiology: Case Studies*:
<http://www.accessemergencymedicine.com>

Copyright © The McGraw-Hill Companies, Inc. All rights reserved.



Source: Schwartz DT: *Emergency Radiology: Case Studies*:
<http://www.accessemergencymedicine.com>

Copyright © The McGraw-Hill Companies, Inc. All rights reserved.

Ann Emerg Med. 2001 Jul;38(1):1-7.

Use of plain radiography to screen for cervical spine injuries.

Mower WR¹, Hoffman JR, Pollack CV Jr, Zucker MI, Browne BJ, Wolfson AB; NEXUS Group.

⊕ Author information

Abstract

STUDY OBJECTIVE: Standard radiographic screening may fail to reveal any evidence of injury in some patients with spinal injury. The purposes of this investigation were to document the efficacy of standard radiographic views and to categorize the frequencies and types of injuries missed on plain radiographic screening of the cervical spine.

- ▶ 818 servikal spinal yaralanma, 570 üçlü servikal grafi
 - ▶ 60 (%10.5) 'okült servikal yaralanma'
 - ▶ 37 (%6.5) kırığı düşündüren radyolojik bulgu mevcut
 - ▶ 23 (%4.1) radyografi negatif, bunlardan 3 tanesi potansiyel unstable servikal yaralanma
 - ▶ 24 olgu SCIWORA
 - ▶ Sensitivite: %89
-
- Normal Servikal grafi servikal spinal yaralanmaları tam olarak dışlayamaz
 - Yaralanmaların indirekt göstergelerine dikkat edilmesi....

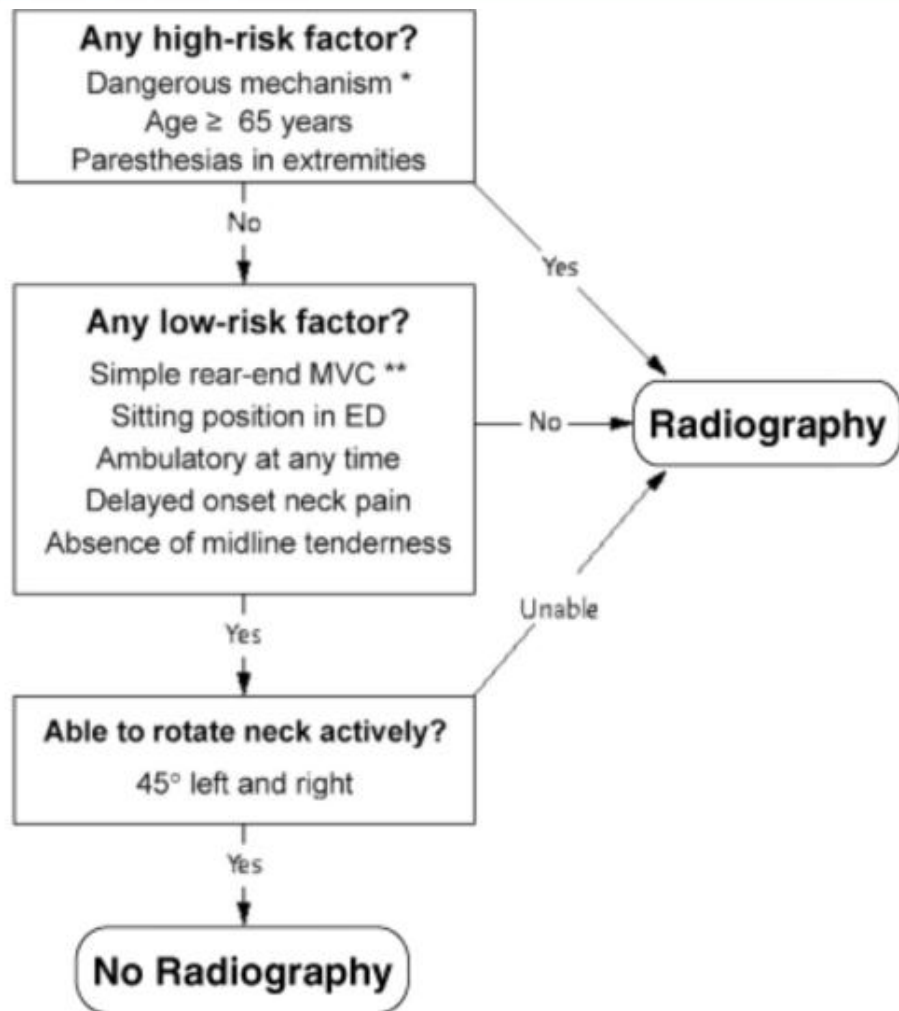
Öneriler...

- ▶ Sistematik değerlendirmeyi unutma....
- ▶ Önce ‘uygunluğu’ değerlendir...
 - ▶ Uygun görüntü elde edemiyorsan
 - ▶ Görüntülemeye rağmen servikal spinal yaralanmayı dışlayamıyorsan
- ▶ Spinal immobilizasyona devam et....



Teşekkürler...

Soru/katkı....



*** – Dangerous mechanism of injury:**

Motor vehicle collision (MVC) at high speed (>100 Km/h), rollover, ejection from vehicle
Fall from > 3 ft or 5 stairs
Axial load to head (diving)
Collision involving a motorized recreational vehicle
Bicycle collision

**** – Simple rear-end MVC excludes:** being pushed into oncoming traffic, hit by a bus or large truck, rollover, hit by a high speed vehicle.

Inclusion Criteria: Adults with acute trauma to the head or neck who are both alert (Glasgow Coma Scale score of 15) and in stable condition (systolic blood pressure > 90 and respiratory rate 10–24/min) and who either have neck pain or no neck pain but all of the following three features: a visible injury above the clavicles, are nonambulatory, and a dangerous mechanism of injury.

Exclusion criteria: altered mental status (GCS score < 15), unstable vital signs, age < 16 years, acute paralysis, known vertebral disease, previous cervical spine surgery, non-trauma cases.

National Emergency X-Radiography Utilization Study Criteria: Cervical Spine Imaging Unnecessary in Patients Meeting These Five Criteria

- ▶ Absence of midline cervical tenderness
- ▶ Normal level of alertness and consciousness
- ▶ No evidence of intoxication
- ▶ Absence of focal neurologic deficit
- ▶ Absence of painful distracting injury

Klavuzlar...



U.S. Department of Health & Human Services www.hhs.gov



AHRQ Agency for Healthcare Research and Quality
Advancing Excellence in Health Care www.ahrq.gov



National Guideline
Clearinghouse

Guideline Summary NGC-9755

Guideline Title

Radiographic assessment. In: Guidelines for the management of acute cervical spine and spinal cord injuries.

Bibliographic Source(s)

Ryken TC, Hadley MN, Walters BC, Aarabi B, Dhall SS, Gelb DE, Hurlbert RJ, Rozzelle CJ, Theodore N. Radiographic assessment. In: Guidelines for the management of acute cervical spine and spinal cord injuries. Neurosurgery. 2013 Mar;72(Suppl 2):54-72. [85 references] [PubMed](#) 

Guideline Status

This is the current release of the guideline.

Awake Asymptomatic Patient

Level I

- In the awake, asymptomatic patient who is without neck pain or tenderness, who has a normal neurological examination, is without an injury detracting from an accurate evaluation, and who is able to complete a functional range of motion examination; radiographic evaluation of the cervical spine is not recommended.
- Discontinuance of cervical immobilization for these patients is recommended without cervical spinal imaging.

Awake Symptomatic Patient

Level I

- In the awake, symptomatic patient, high-quality computed tomography (CT) imaging of the cervical spine is recommended.
- If high-quality CT imaging is available, routine 3-view cervical spine radiographs (CSRs) are not recommended.
- If high-quality CT imaging is not available, a 3-view cervical spine series (anteroposterior, lateral, and odontoid views) is recommended. This should be supplemented with CT (when it becomes available) if necessary to further define areas that are suspicious or not well visualized on the plain cervical x-rays.

Level III

- In the awake patient with neck pain or tenderness and normal high-quality CT imaging or normal 3-view cervical spine series (with supplemental CT if indicated), the following recommendations should be considered:
 1. Continue cervical immobilization until asymptomatic.
 2. Discontinue cervical immobilization following normal and adequate dynamic flexion/extension radiographs.
 3. Discontinue cervical immobilization following a normal magnetic resonance image (MRI) obtained within 48 hours of injury (limited and conflicting **Class II** and **Class III** medical evidence).
 4. Discontinue cervical immobilization at the discretion of the treating physician.

