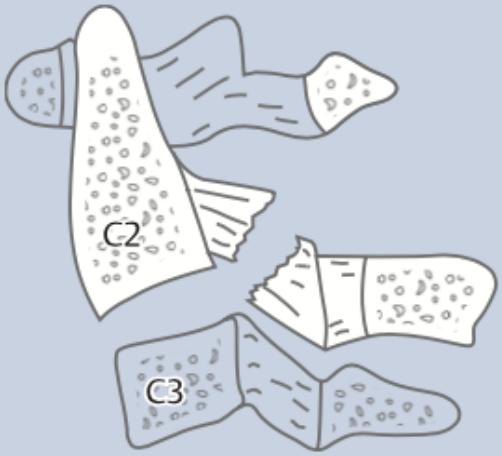
Levine and Effendi classification

The system of Effendi et al, as modified by Levine and others, is widely used in grading adult HF (not applicable to peds). Angulation is measured as the angle between the inferior endplates of C2 and C3. Anterior subluxation of C2 on C3 > 3 mm (Type II) is a surrogate marker for C2–3 disc disruption, which can be evaluated more directly with cervical MRI.

Type	Description	Radiographic findings	Mechanism	Comment
I	vertical pars fx just posterior to the VB	≤ 3 mm subluxation of C2 on C3 & *no* angulation	axial loading & extension	stable on flexion/extension X-rays. Neurologic deficit rare
I A	fx lines on each side are not parallel. Fx may pass thru *foramen transversarium* on one side	fx line may not be visible on X-ray. *Anterior* C2 VB may be subluxed 2–3 mm anteriorly on C3 & the C2 VB may appear elongated	may be hyperextension + lateral bending	"atypical hangman's fracture."[53] Spinal canal may be narrowed. 33% incidence of paralysis
II	vertical fx thru pars. *Disruption of C2–3 disc* & posterior longitudinal ligament	subluxation of C2 on C3 > 3 mm and/or angulation[b]. Slight anterior compression of C3 possible	axial loading & extension with rebound flexion	may lead to early instability. Neurologic deficit rare. Usually reduces with traction
IIA	oblique fx (usually anterior-inferior to posterior superior)  little subluxation (usually ≤ 3 mm) but more angulation (can be > 15°)		flexion distraction (posterior arch fails in tension)	rare (< 10%). Unstable. ✖ Traction → increased angulation & widening of disc space ∴ *do not use* traction
III	Type II + bilateral C2–3 facet capsule disruption. C2 posterior arch is free floating. Anterior longitudinal ligament may be disrupted or stripped off C3	facets of C2/C3 may be subluxed or locked	unclear, may be flexion (capsule disruption) followed by compression (isthmus fracture)	rare. Neurologic deficit may occur & may be fatal. Facet dislocation usually cannot be reduced by closed reduction. ✖ Traction may be dangerous (see text)

Effendi Classification

Effendi classification.