AO Spine—DGOU Osteoporotic Fracture (OF) Classification System

OF 1

No deformation (vertebral body edema in MRI-STIR)
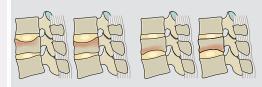
- Typically not visible on x-rays: chance to find on MRI

OF 2

Deformation of one endplate without or with only minor posterior wall involvement

- With posterior wall < 1/5 involvement

OF 3

Deformation of one endplate with distinct posterior wall involvement

- With posterior wall > 1/5 involved

OF 4

Deformation of both endplates with/without posterior wall involvement

- Loss of vertebral frame structure
- Vertebral body collapse
- Pincer type fracture

OF 5

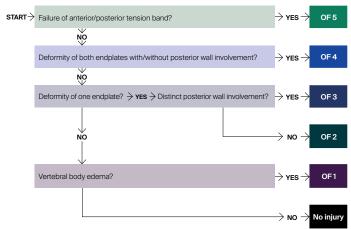**Injuries with anterior or posterior tension band failure**

- Injuries with signs of distraction, rotation, or translation
- Hyperextension with anterior tension band failure

Algorithm for morphologic classification

START → Failure of anterior/posterior tension band? → YES → **OF 5**

NO ↓

Deformity of both endplates with/without posterior wall involvement? → YES → **OF 4**

NO ↓

Deformity of one endplate? → YES → Distinct posterior wall involvement? → YES → **OF 3**

→ NO → **OF 2**

NO ↓

Vertebral body edema? → YES → **OF 1**

→ NO → **No injury**

Modified score for therapeutic decision making in OF*

Parameter	Grade	Points
Morphology (OF 1-5)	1–5	2–10
Severity of Osteoporosis	T-Score <-3 or qCT: HU ≤ 90	1
Deformity Progression	Yes, No	1, -1
Pain (under analgesia)**	VAS ≥ 5, < 5	1, -1
Neurological Symptoms (N2-N4)	Yes	2
Mobilisation (under analgesia)	No, Yes	1, -1
Health Status	ASA >3, ***mFI > 2, Anticoagulation	Each -1, Maximum -2

0 points if a parameter is unknown or not determinable;
0–5 points = Conservative therapy;
  6 points = Conservative therapy or surgery;
 > 6 points = Surgery.

*   The severity score system has not been validated yet and should be used as a reference only.
**   According to step II WHO pain ladder.
*** 5-item modified frailty index (mFI) = COPD, or recent pneumonia; Congestive heart failure; Functional status (not independent); Hypertension requiring medication; Diabetes mellitus.