Anterior Cervical Plate–Screw Fixation and Interbody Cages

How should these implants be named

An anteriorcervical plate–screwsystem consists of a plate placed along the anterior surfaces of the vertebral bodies and screws securing it to the bone. Interbody fusion cages are implants placed in the intervertebral disc spaces after disc removal.

These components may be used together in anterior cervical discectomy and fusion (ACDF). ACDF is the name of the surgical procedure, not of an individual implant. [1,2]

Indications

The main indications include nerve root and spinal cord compression due to cervical disc herniation or degenerative changes in appropriately selected patients. These implants may also be used in traumatic disc–ligament injuries and instability. Surgical decisions incorporate clinical findings and spinal stability. [1,2]

Placement and mechanism of action

The affected disc is removed through an anterior approach to the neck; compressive disc material and, when necessary, osteophytes are removed. A cage inserted into the resulting disc space helps maintain disc height and segmental alignment and, together with bone graft, provides structural support for fusion. [1]

The anterior plate and screws provide mechanical stability while fusion develops. The goal is osseous fusion at the operated levels; unlike disc arthroplasty, preservation of motion at these levels is not intended. [1,2]

Imaging recognition clues

On lateral radiographs,the plate lies anterior to the vertebral bodies, the screws extend into the bodies, and the cages occupy the disc spaces. The bodies of some cages are not conspicuously radiopaque; their positions are identified by radiopaque markers. Material, manufacturer, and model cannot be established from this appearance alone. [3]

To distinguish this construct from a corpectomy reconstruction, assess preservation of the vertebral bodies and cage location rather than the plate alone. [3]

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Feature	Discectomy and interbody cage	Corpectomy and vertebral body replacement cage
Structure removed	Disc; compressive osteophytes when necessary	Part or all of a vertebral body and the associated discs
Cage location	Disc space	Defect created by removal of the vertebral body
Intervening vertebral body	Preserved	Partially or completely removed, depending on the extent of surgery
Anterior plate	May be used	May be used

Imaging findings in our clinical case

Anteroposterior and lateralcervical radiographs show anterior plate–screw fixation in the lower cervical spine and implants consistent with interbody cages in two separate disc spaces. Together with preservation of the intervening vertebral body, the appearance is consistent with postoperative changes following two-level ACDF.

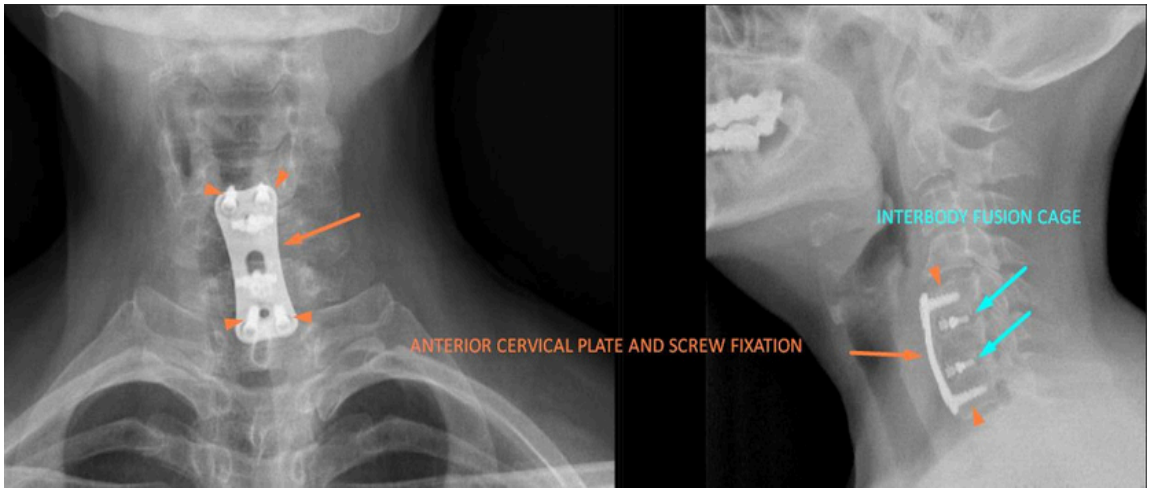


Figure 1. Cyan arrows indicate the radiopaque cage markers, orange arrows indicate the anterior plate, and arrowheads indicate the fixation screws.

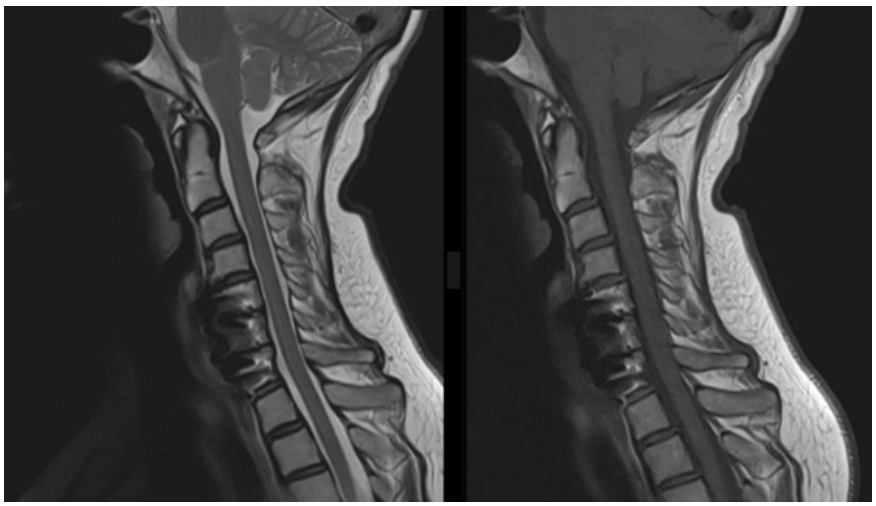


Figure 2. Sagittal cervical MR images demonstrate implant-related signal loss and artifacts at the operated levels.

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Sample reporting statements

For radiographs: “Anterior plate–screw fixation and implants consistent with interbody cages are seen in two disc spaces in the lower cervical spine. The appearance is consistent with postoperative changes following two-level anterior cervical discectomy and fusion.”

If the levels have been confirmed on the original examination: “Anterior plate–screw fixation extends from C5 to C7, with interbody cages in the C5–6 and C6–7 disc spaces.”

If MRI assessment is actually limited: “Implant-related metal artifacts limit assessment of adjacent structures at the corresponding levels.”

Checklist item	Feature to assess
Levels and extent	Plate span and disc spaces containing cages
Plate–screw system	Integrity, displacement, screw back-out, and periscrew radiolucency suggesting loosening
Cages	Position, displacement, and subsidence into the endplates
Spinal alignment	Segmental angulation or malalignment
Fusion	Osseous bridging on appropriate examinations; the presence of implants alone does not prove fusion
Spinal canal and neural structures	Residual compression and cord signal changes, to the extent assessable on MRI
Prior examinations	Interval changes in implant position and alignment

These items should be assessed according to the scope of the examination and the imaging modality used. [3]

Contributions of imaging modalities

Radiographs are used toassessoverall implant position, alignment, and integrity. CT contributes to assessment of bone, fusion, and the implant–bone interface; MRI contributes to assessment of the spinal cord, nerve roots, and soft tissues. Metal artifacts may limit assessment. Modality selection depends on the clinical question. [3]

Limitations specific to this case

Theprovided radiographic andMR screenshots allow identification of the implant components. These limited images cannot establish that fusion is complete or that all implants are free of complications. Cage material, manufacturer, and model cannot be confirmed. Assessment should incorporate the complete original examinations and clinical information.

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Practical pearl

Theanteriorplate stabilizes; the cage in the disc space supports. When distinguishing this construct from a corpectomy reconstruction, check whether the vertebral body is preserved.

References

1. AmericanAcademy of Orthopaedic Surgeons. Cervical Radiculopathy: Surgical Treatment Options.

2. AO Foundation. AO Surgery Reference: Anterior plating.

3. Corona-Cedillo R, Saavedra-Navarrete MT, Espinoza-Garcia JJ, et al. Imaging Assessment of the Postoperative Spine: An Updated Pictorial Review of Selected Complications. Biomed Res Int. 2021;2021:9940001. doi:10.1155/2021/9940001.

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