SACROPELVIC FIXATION

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Introduction

- **Rigid internal fixation** → higher fusion rates

- **Lumbosacral fusion**
  - L5-S1 fixation alone
  - **Pelvic fixation** - long constructs, high grade spondylololisthesis, unstable sacral fractures, sacral tumors
Introduction

- Various Pelvic Fixation Methods:
  - Galveston technique, S2 screws, four rod technique,
  - S2 alar iliac screws, and S1-iliac screw
Indications for Sacropelvic Fixation

- Long fusions extending to the sacrum
- Flat-back deformity requiring corrective osteotomy
- Correction of pelvic obliquity
- High-grade (Grade III or higher) spondylolisthesis
- Sacrectomy
- Sacral fractures with spinopelvic dissociation
- Osteoporosis in the setting of lumbosacral fusion
Lumbosacral and Spinopelvic Fixation Techniques

- Sacral Sublaminar Wires and Hooks
- Sacral (S1) Tricortical Pedicle Screws
- S2 and Sacral Ala Anchors
- Iliosacral Screws
- The Jackson Intrasacral Rods
- The Galveston Technique
- Iliac Screws (Iliac Bolts)
- S2 Alar Iliac Screws for Pelvic Fixation
Sacral Sublaminar Wires and Hooks

Implants are placed dorsal to the mechanical axis of rotation at L5–S1.

- Poor pullout strength
- High rate of failure
- Lack the biomechanical strength to serve as a rigid fixation
Sacral (S1) Tricortical Pedicle Screws

Tricortical screws (through the sacral promontory)

Have twice the insertional torque

Even so,

long fusions ending at the sacrum have failure rates as high as 44%
S2 and Sacral Ala Anchors

- Offer very little additional strength for resisting pullout (dorsal to the pivot point)
- Narrow safe insertion zones
- Requiring extensive muscle dissection
- Decreasing bone surface available for fusion
Iliosacral Screws
Technique of percutaneous transsacral screw stabilization for sacroiliac joint injury and sacral fractures

Results of a series of 20 cases
F. LAUDE, Ph. PAILLARD
Hôpital de la Pitié. Boulevard de l'hôpital. 75013 Paris
The Jackson Intraspinal Rods
Axial CT image of the sacrum severe osteoporosis and bilateral comminuted fractures of the alae
After intubation and positioning on a Jackson table in the operating room.
Axial CT images of the sacrum
During placement of vertebroplasty needle
Axial CT images of the sacrum

After placement of transiliosacral rod
Axial CT images of the sacrum

After sacroplasty
The Galveston Technique
Iliac Screws (Iliac Bolts)
S2 Alar Iliac Screws for Pelvic Fixation
Modified S2AI screw with quad-cortical purchase
S2 Alar Iliac Screws for Pelvic Fixation

1) screw loosening on the intra-iliac side at 1 year postoperatively
2) no loosening is seen on the quad-cortical side
Complications of Sacropelvic Fixation
How to Avoid Them?

- Misplacement and Injuries to Adjacent Structures
- Implant Prominence and Loosening
- Wound Problems and Infection
- Nonunion and Implants Failure
Instrumentation-related problems

- Poor bone quality of the sacrum
- Complex regional anatomy
- Tremendous biomechanical forces
Failure (F) and

Major F: rod breakage between L4 and S1, failure of S1 screws (breakage, halo formation, or pullout), and prominent iliac screws requiring removal

Minor F: rod breakage between S1 and iliac screws and failure of iliac screws (not require revision surgery)
Bilateral rods breakage at L5-S1 level which is considered Major failure because it needed a revision surgery due to pseudarthrosis.
Unilateral rod breakage below the S1 level which is a Minor failure because it doesn’t need a revision surgery as it can occur due to continuous motion at the SI joint after solid fusion at L5-S1.
CASE.1

- A 36 year male with chief complaint of low back pain after falling down.
CASE.2

• A 33 years old lady with cc of both leg pain and low back pain following falling down whom refered to our hospital due to pelvic fx. both her legs were fixed in primary center.

• v/s : stable

• In neurologic exam: lower exteremity weakness accompanied with sensory deficit.
CASE 2