



Scoliosis (n.)

- lateral curvature of the spine, 1706, medical Latin, from Greek *skoliosis* "crookedness," from *skolios* "bent, curved," from PIE root **skel-* "bend, curve," with derivatives referring to crooked parts of the body (as in Greek *skelos* "leg, limb; Latin *scelus* "malice, badness, crime;" Old High German *scelah*, Old English *sceolh* "oblique, curved, squinting;" Albanian *çalë* "lame"). Related: *Scoliotic*.
- Hippocrates first described it
- Galen credited for coining the terms scoliosis, kyphosis and lordosis

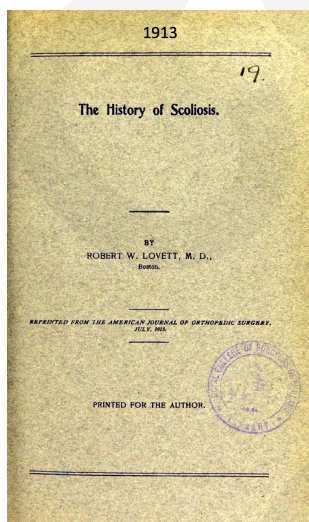
Scoliosis in History

- 3200 BC first written history
- Ancient Hindu text – Lord Krishna reported healed a servant woman who had a severe spinal deformity by stepping on her feet and lifting her chin



Scoliosis in History

- 400 BC Hippocrates "there are many varieties of curvature of the spine even in persons who are in good health; for it takes place from natural conformation and from habit."
 - Spinal manipulation and traction (scamnum)
 - Succussion: strapping patient to ladder, hoisting into air, and dropping
- 0 AD Jesus heals a woman who is described as one who was "bent over and could not straighten up at all"



Treatment of Scoliosis An Historical Perspective

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Scoliosis

Review

Historical overview of spinal deformities in ancient Greece
Elias S Vasiliadis*, Theodoros B Grivas and Angelos Kaspiris

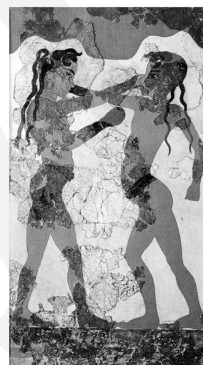
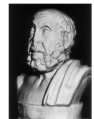


Figure 2
The Boxing Boys" fresco from Room Beta I, Akrotiri, Thera (1600 BC).



Figure 3
A marble statue of Alexander the Great, showing a characteristic body asymmetry in the axis of the head, shoulders and neck, Istanbul, Turkey (356 BC)

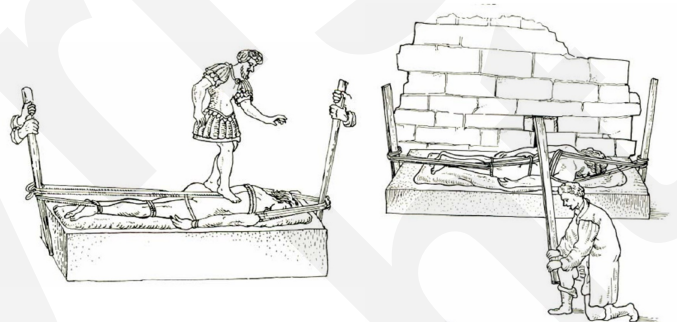
- Hippocrates
 - 460-370BC



- Galen
 - 130-200AD

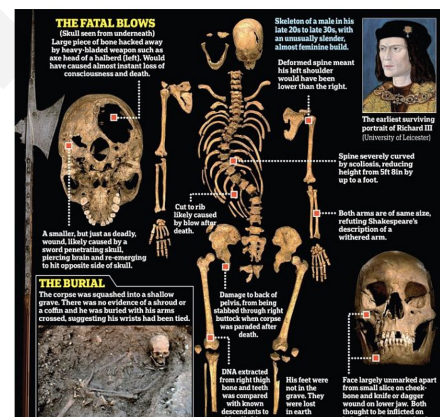


- Hippocrates first to use term scoliosis 400 BC
- Little or no idea what the condition was
 - Due to TB and the attitudes in which these people lie
- Treatment:
 - Tied to a ladder and suspended then lifted and ladder dropped to the ground
 - Apparatus for extension and pressure on the prominence
 - "It is also safe for a person to sit upon the hump while extension is being made, and raising himself to let himself fall down again upon the patient"
- Assumed the affection was due to a dislocation, which demanded reduction only



- Nil significant for 2000 years
- The Dark Ages (400-1000AD) – heretics often had scoliosis and were treated on the Rack!
- 650 Aegina bandaging to wooden strips
- 1100 Albukasis “no one could cure curvature to the side”
- Up to 18th century all curvatures of the spine were considered “dislocations”

1485 Battle of Bosworth



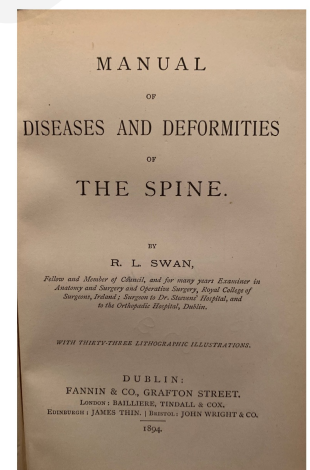
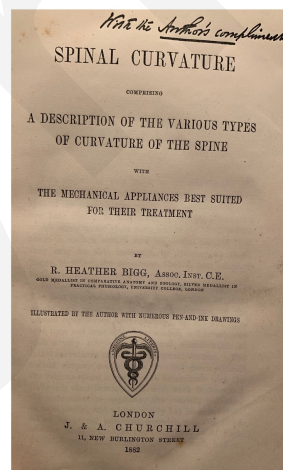
15th Century Manuscripts

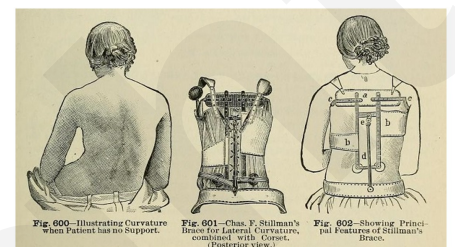
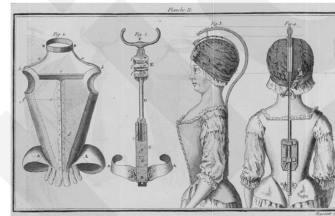
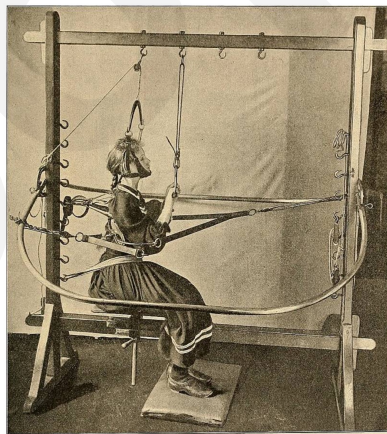
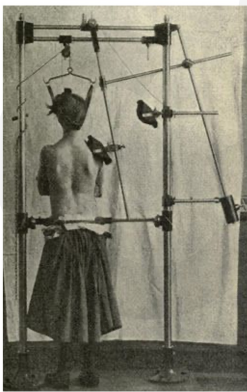
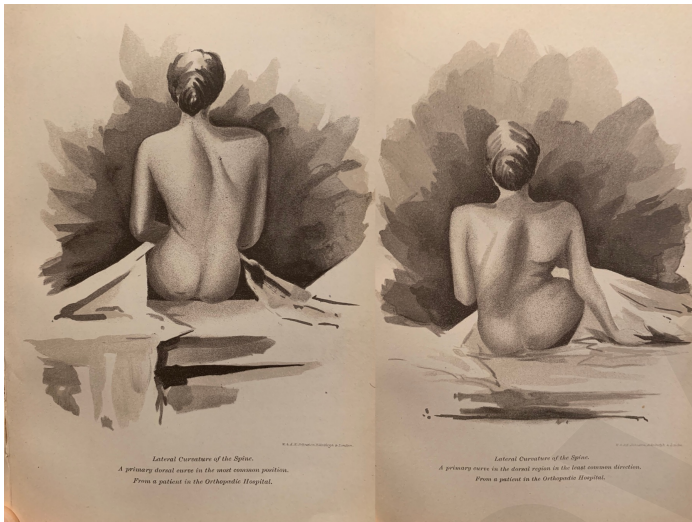


- 1646 Fabricius Hildanus first autopsy of scoliotic case – added little to the knowledge of the condition
- 1660 Glisson – suspension treatment in children with rachitis (rickets) affecting the spine
- 1696 Nuckius - head sling proper for wry neck
- 1691 Jungken - whale bone corsets
- 1700 Heister – iron cross
- **1741 Andre – inventor of the term orthopaedic** – condemned high heels and bad sitting position – gymnastics and apparatus for treatment
- 1878 Lewis A Sayre “Spinal Disease and Spinal Curvature”
 - Self suspension and plaster of Paris jacket
 - Suspension credited to Dr Lee and Prof Mitchell in Philadelphia
- **1839 Guerin – first surgery for scoliosis – percutaneous myotomies and bracing**
- 1889 Volkmann – first bony operation on scoliosis – attempted to resect the rib deformities
- 1895 Bradford and Brackett – horizontal distraction frame with localiser – cast application with 3 point fixation

Ambrose Pare born 1510

- A dislocated vertebra standing forth and making a bunch is termed in Greek kyphosis, but when it is depressed it is called lordosis, but when the same is luxated to the right or left side it maketh a scoliosis, which, wresting the spine, draws it into the similitude of the letter S...”
- **First to treat scoliosis with a brace:**
 - Padded iron corset
- Still considered a dislocation
- 1762 Maguy – corset
- 1768 Levacher – whalebone corset affixed a jury mast and head sling – Jurymast brace allowing distraction
- **1779 Percival Pott – TB – spinal deformity was not a dislocation but a disease of the bone**
- 1780 Vennel - founded first orthopaedic hospital specialising in treatment skeletal deformities
- Gymnastic treatment – Sydenham 1624, Fullers 1704, Tissot 1781, Ling 1839, Langgard 1868

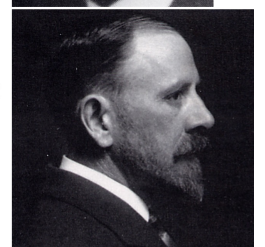
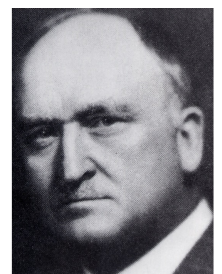


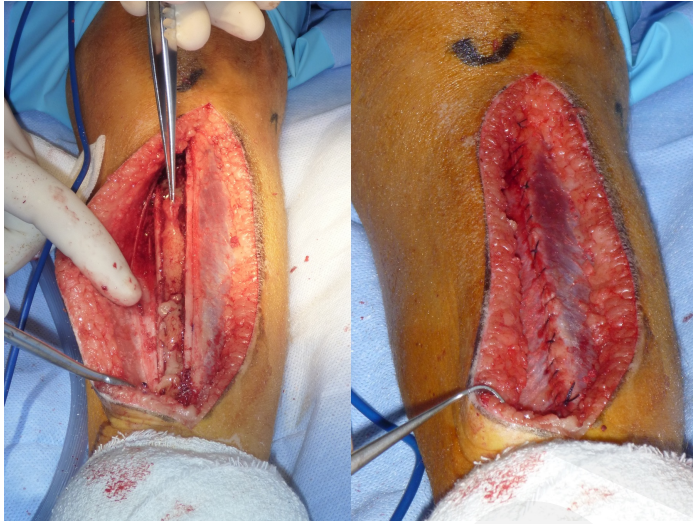


• 1895 Röntgen— XRs

- 1902 Lange – steel rods and wire anchored to spinous processes to treat TB kyphosis
- 1906 Bohn – distinction of acquired vs congenital scoliosis
- 1910 German Orthopaedic Congress – severe scoliosis not due to school

- 1911 Albee – **Spinal fusion** for Potts disease using tibial autograft split and laid onto spinous processes – DeQuervain and Hoessly used scapular bone
- 1911 Hibbs – TB fusion as well;
- 1914 Hibbs - **spinal fusion for scoliosis** – preoperative traction jack / head pelvic traction, meticulous fusion technique, cast immobilisation 6-12 months post op, 2% mortality 25% revision as fusion too short

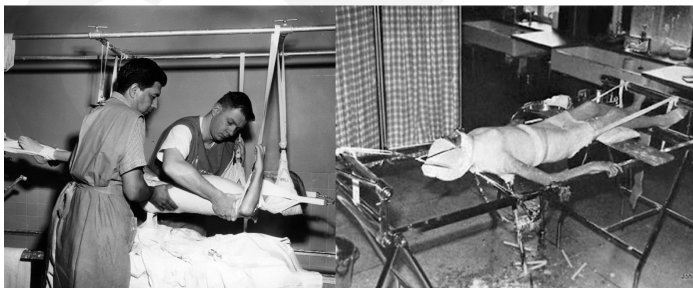




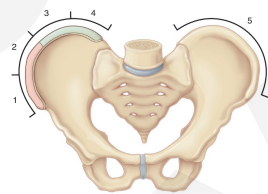
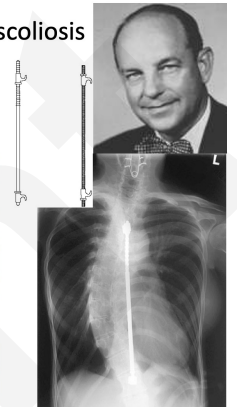
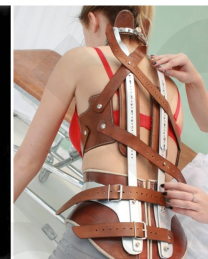
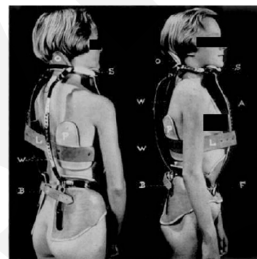
- 1921 Schroth method
- 1931 Hibbs, Risser and Ferguson – **turnbuckle cast** and window through cast for fusion whilst maintaining correction
- 1934 Ito – anterior approach for Potts Disease
- **1944 King – first vertebral screw**
- **1948 Cobb – method for measuring scoliosis**



- 1950s Risser – localiser cast with specialised table



- 1950s Blount and Schmidt – **Milwaukee brace** – leather neck ring and pelvic girdle for distraction – initially used post operatively
- 1954 Smith – VB Staples congenital scoliosis
- 1955 Allen – expandable jacket
- **1955 Harrington – single rod**



- 1958 **Risser – sign**
- 1958 **Moe**
 - Importance of meticulous fusion technique – excision of facets and fusion
 - Fuse from neutrally rotated vertebra to neutrally rotated vertebra
 - Advocated side bending radiographs for flexibility
- 1958 Gruca – implanted springs on the convexity and distraction device on concavity without fusion

- 1965 **Hodgson** – anterior hemivertebra excision
- 1969 **Dwyer** – anterior segmental compression instrumentation with cable
- 1975 **Zielke** – solid flexible rod instead allowing for derotation
- 1970s **Hall** – modification of Moe facet fusion – inferior facet removed with a gouge, superior facet curetted, cancellous graft placed in defect

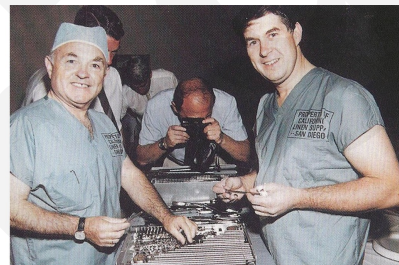
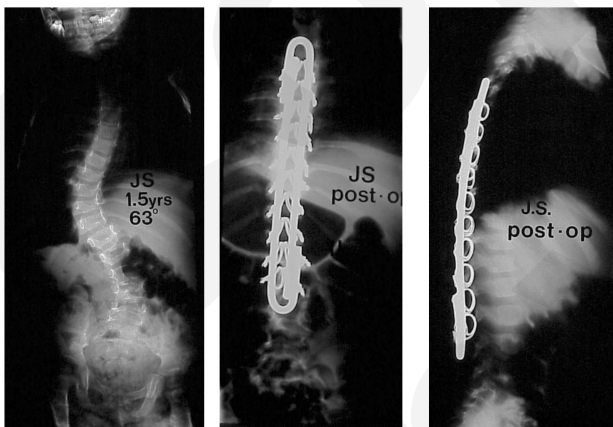
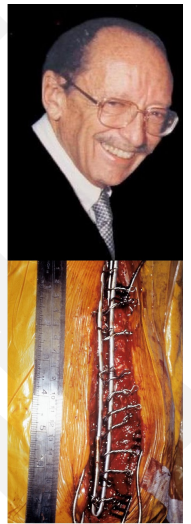


Clin Orthop 62:192, 1969

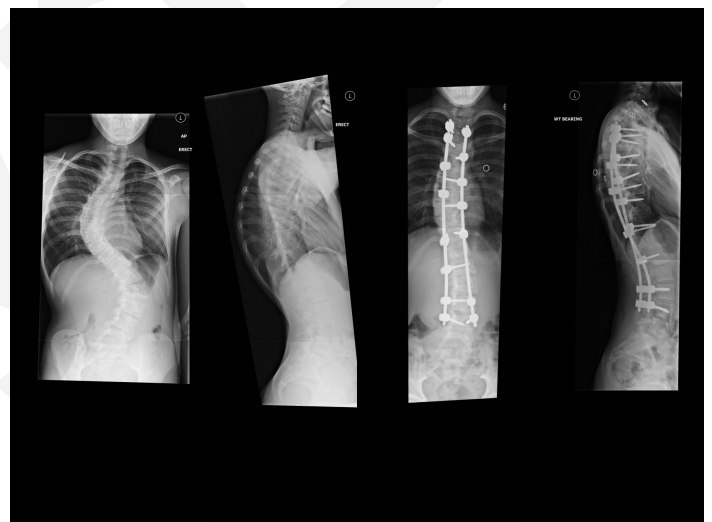
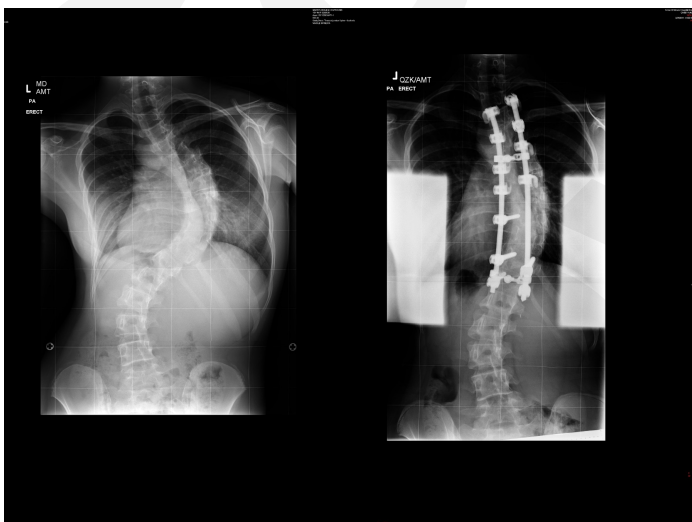
- 1962-1972 Harrington – work rejected by journals
- **1963 Roy Camille – first pedicle screw**
- 1973 Harrington – SRS president suggested international spinal data registry – failed to follow through but it resurfaced in 1990s for THR and TKR registries!
- 1970s Hall and Miller – **Boston brace**

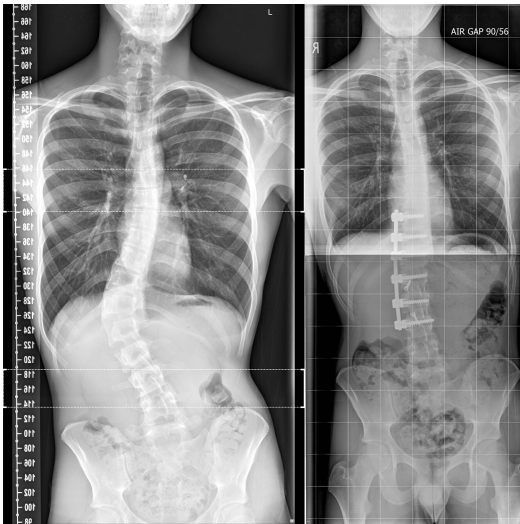


- 1970s **Luque** – sublaminar wires
- 1972 Mehta – rib vertebral angle
- 1973 Winter – congenital kyphosis Hx
- 1978 Zorab – lung function after fusion
- 1982 McMaster – congenital scoliosis classification
- 1983 **King Moe** – classification scoliosis
- 1983 **Weinstein** – natural Hx AIS
- 1984 Moe – used Harrington rods subcutaneously in young children
- 1984 Lonstein – prediction curve progression

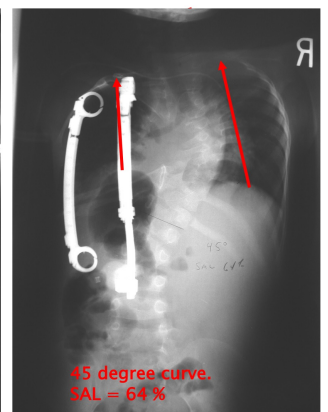
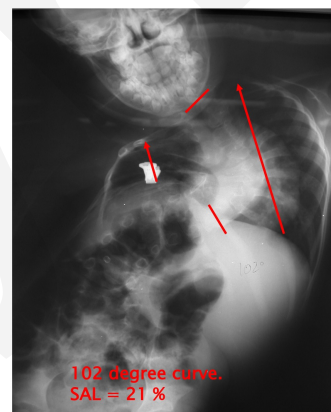
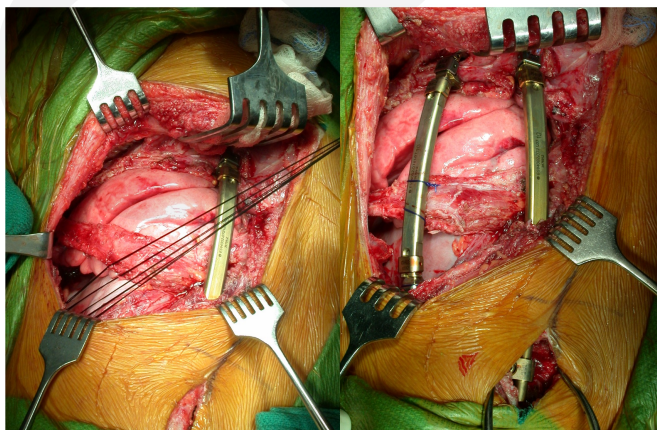
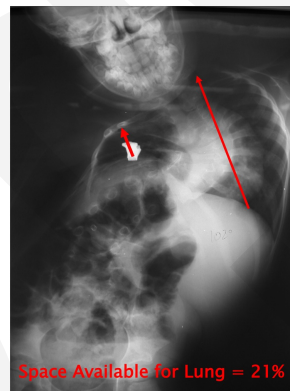
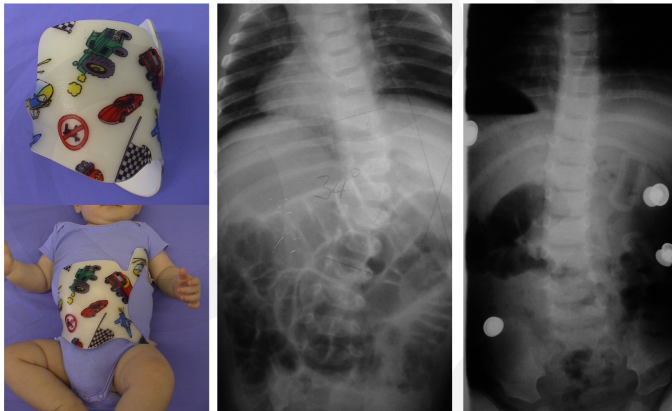
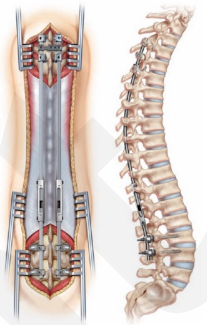


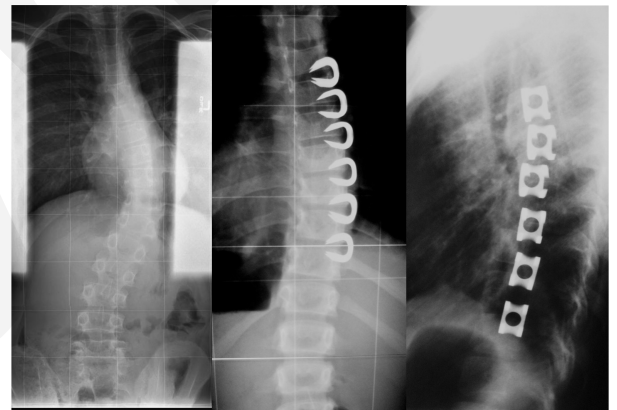
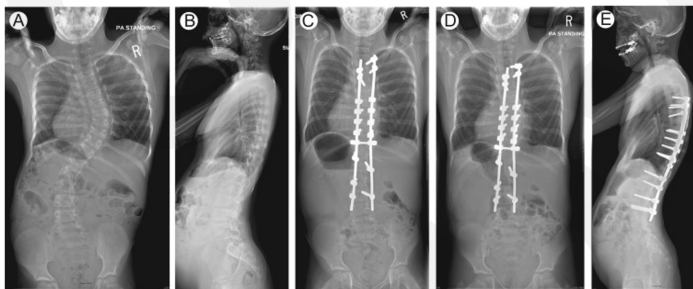
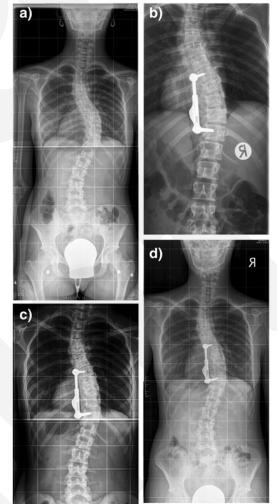
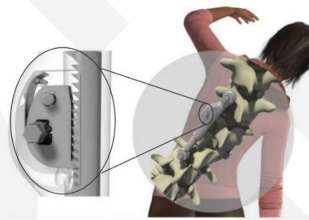
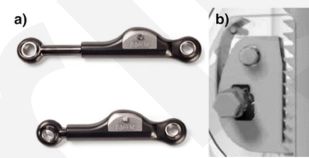
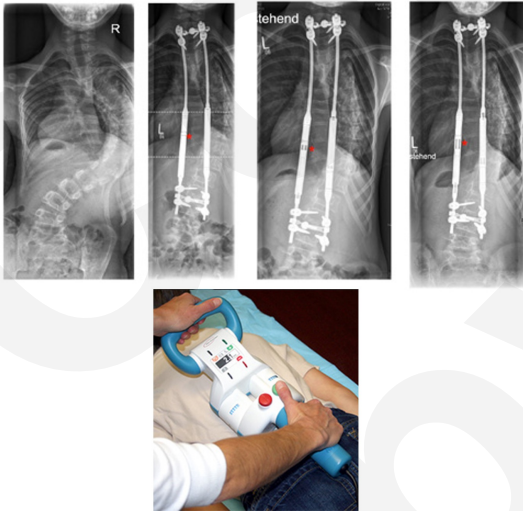
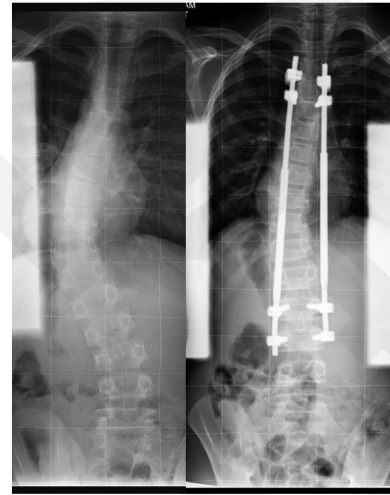
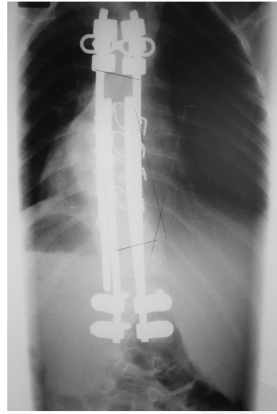
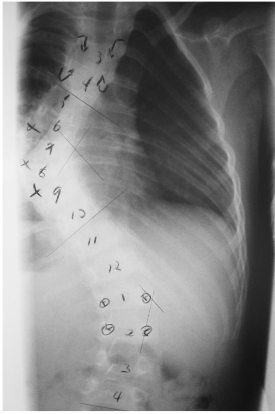
- 1984 **Cotrel and Dubousset** – segmental instrumentation pedicle screws and hooks with 3 dimensional correction and crosslinking of the rods
- 1970s / 80s / 90s – Steffee plate and screws, Hartshill Rectangle, Isola, TSRH, USS, Kaneda...
- Posterior Segmental Spinal Fusion with rods and screws has become the main treatment in surgical management of AIS

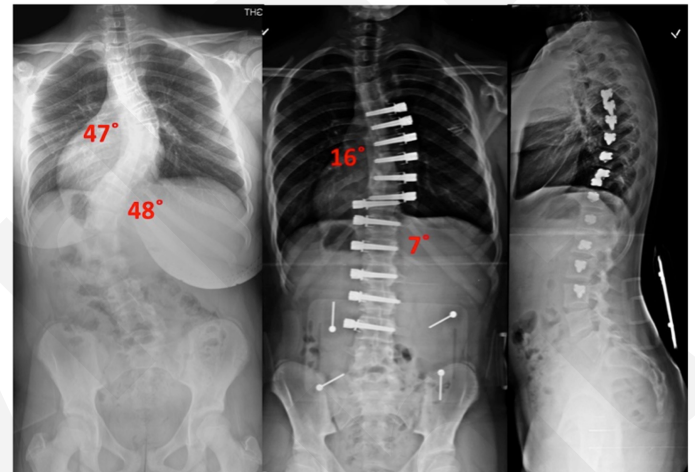




- 1990 Reed / Hooper - Charleston brace
- 1998 Rivard / Coillard - SpineCor brace
- 2001 **Lenke** – classification scoliosis
- 2003 Campbell – VEPTR
- 2003 Betz – VB Staples
- 2005 Akbarnia – dual growing rods
- 2006 SRS classification scoliosis
- 2009 Akbarnia – MAGEC
- 2010 McCarthy – SHILLA
- 2011 Newton - VBT
- 2015 Floman – Apifix







The Future...

