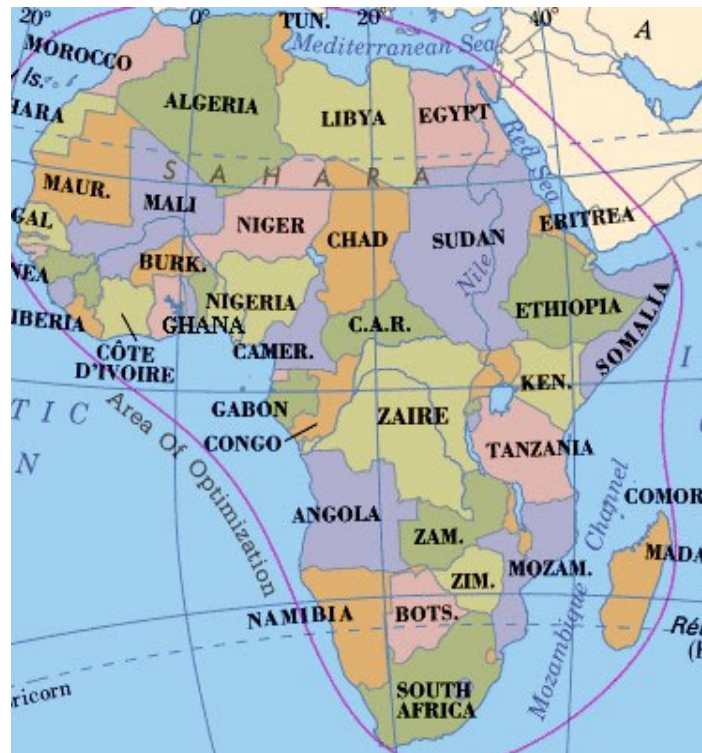


# Early Onset Spinal Deformity in Developing Regions: What Options are Available?.

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Oheneba Boachie-Adjei MD  
Professor of Orthopedics  
Founder and President, FOCOS

# World Health

---

## The World Health Report 1998

Life in the 21st century  
A vision for all

Report of the Director-General



World Health Organization  
Geneva  
1998

- Two thirds of the world's 6 billion persons live in countries defined as "developing"
- Approximately half of the world's population lack access to adequate primary health care

# World Health

---

## The World Health Report 1998

Life in the 21st century  
A vision for all

Report of the Director-General



World Health Organization  
Geneva  
1998

- As a result, life expectancy in developing countries is about 52 years of age, compared with 80 to 82.5 years in the world's most

## Physicians (number)

Country	Value	Latest Year
Ghana	3,240	2004
Nigeria	34,923	2003
South Africa	34,829	2004
United States of America	730,801	2000



# Orthopaedics in the Developing World:

## Present and Future Concerns

*John P. Dormans, MD, Richard C. Fisher, MD and Stephan G. Pill, MS, PT*

---

- Approximately two thirds of the world's population lack adequate orthopaedic care and essential radiological services
- Increased trauma-related injury will add to the already substantial burden of musculoskeletal disease throughout the world.

# Orthopaedics in the Developing World: Present and Future Concerns

*John P. Dormans, MD, Richard C. Fisher, MD and Stephan G. Pill, MS, PT*

---

- *This problem is compounded in the developing world by a lack of trained medical personnel, a lack of medical facilities, and, in many regions, an inability to access existing facilities*



# The global Burden of Musculoskeletal Disease

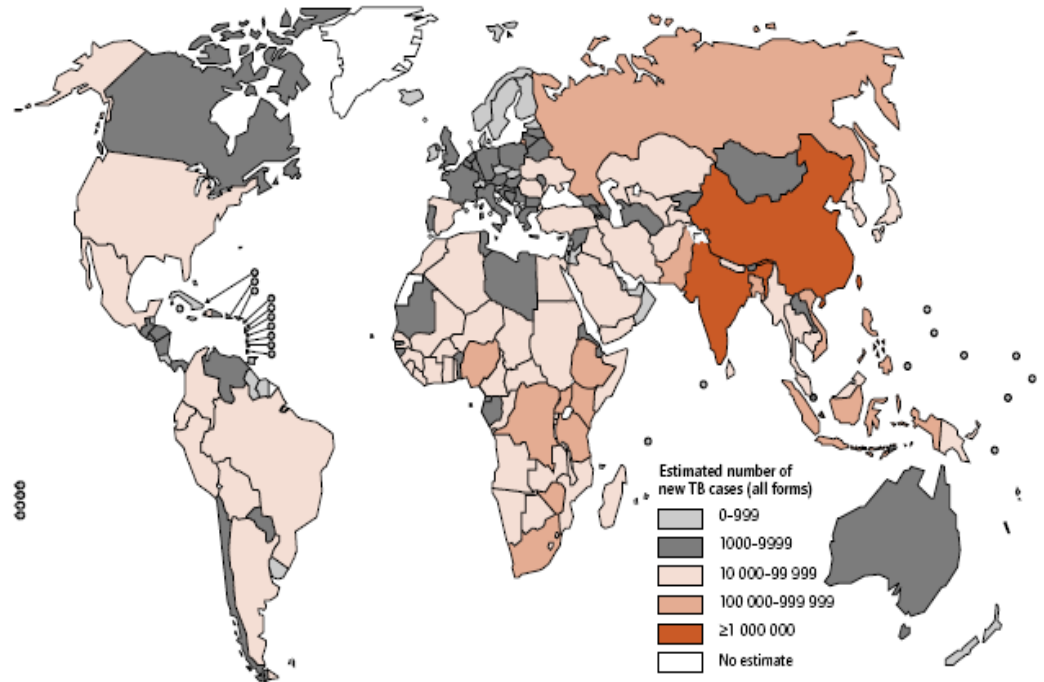
## ■ Predominant conditions

- Traumatic injuries
- Neglected congenital deformities
- Sequela of Infections
  - ⇒ Osteomyelitis
  - ⇒ Polio
  - ⇒ Tuberculosis
  - ⇒ Leprosy



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COMPLEX SPINE

■ **FIGURE 1.1**  
Estimated number of new TB cases, by country, 2007



**EARLY ONSET SPINE DEFORMITIES**

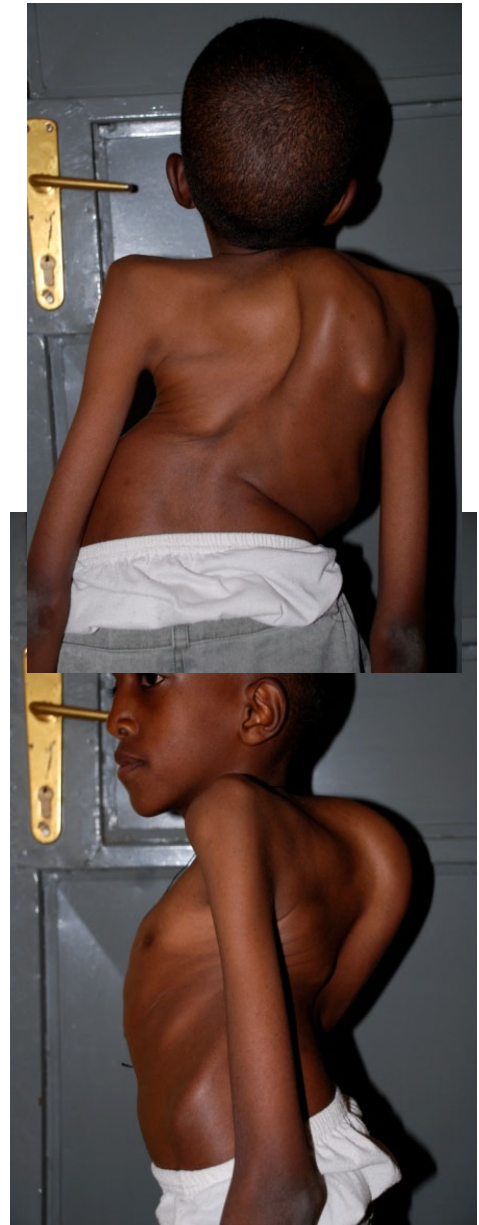




# The Challenges of Early Onset Spine deformity treatment

---

- **Diagnostic modalities unavailable**
- **Poor environment for Cast/Brace**
- **Pediatric patients with low BMI and Low PFTS**
- **Pediatric intensive care unavailable**
- **Neurologic deficit with severe Kyphosis**
- **Intraspinal Anomalies undiagnosed**
- **Limited instrumentation choices**
- **Complex procedures only choice for some cases**





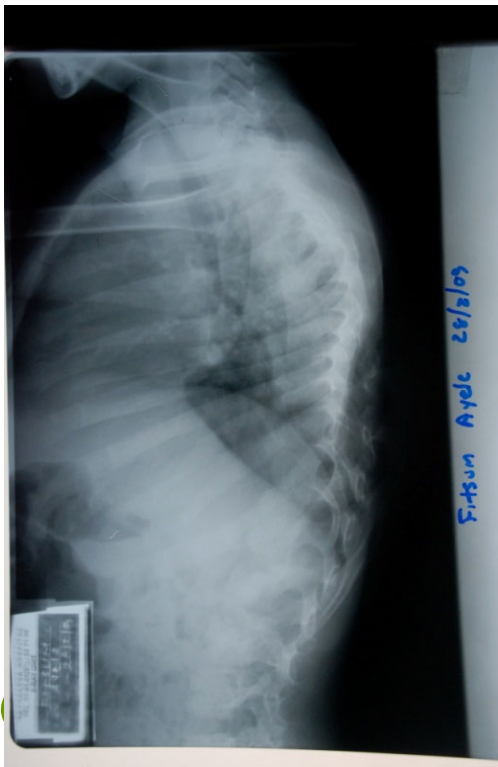
## SB 3F Mild Scoliosis: No treatment Rx: Controlled Observation





# FA 5M EOS No Treatment

**Rx: Immediate treatment  
(Surgical) Non- Fusion**



**COMPLEX SPINE**

# DS 10M Progressive EOS

## No Treatment

Rx: Surgical -Fusion



**FOCOS**

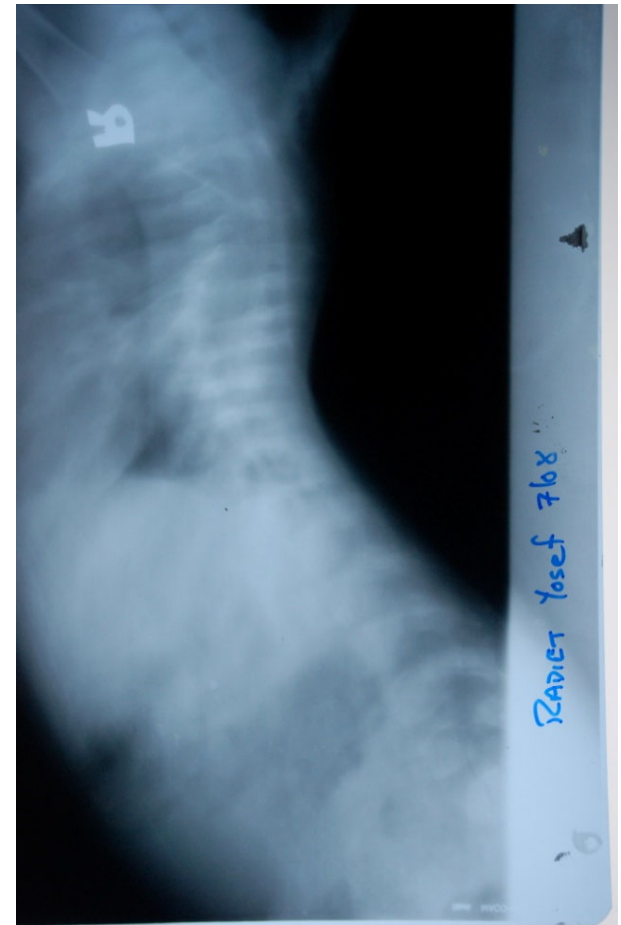
FOUNDATION OF ORTHOPAEDICS AND  
COMPLEX SPINE

# **RY 2M Congenital Lordo-Scoliosis**

## **No treatment**

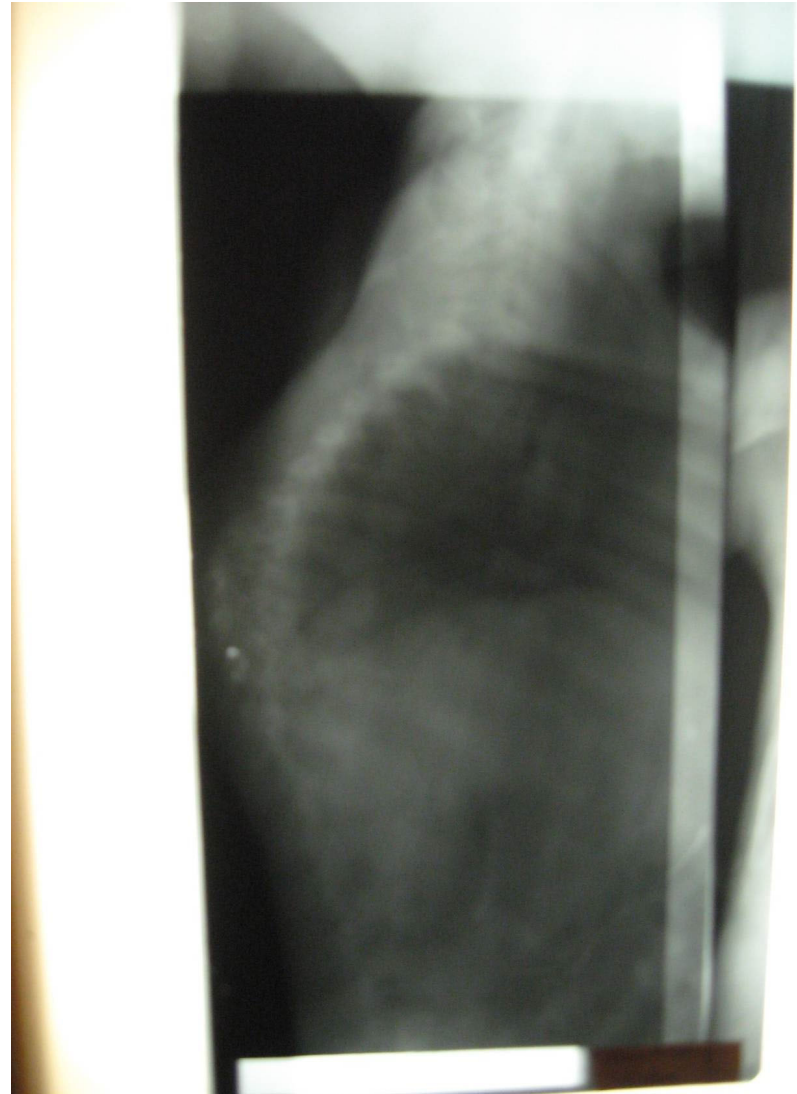
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- **Rx: Surgical ASAP**





## **MJ 7M Progressive kyphosis:No Diagnosis and No Treatment**



# HK 7F Progressive EOS NT

**FVC 0.15 (15%)    FEV1 0.10 (12%)**

---









**HK 7F Progressive EOS NT**  
**FVC 0.15 (15%) FEV1 0.10 (12%)**  
**Rx: May Be too Late**

---

**VIDEO**



**FOCOS**

FOUNDATION OF ORTHOPAEDICS AND  
COMPLEX SPINE

## FOCOS was created to serve an acute need

---

- The organization provides EPI expertise and technology in musculoskeletal surgery and rehabilitation through volunteer teams of leading medical professionals
  - Specialty in spine, hip & knee replacement, clubfoot etc
  - Organization absorbs majority of patient costs. Nominal hospital fees for some financially capable patients.

# FOCOS Goals

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- To achieve arthrodesis
- Stabilize Deformity
- Obtain safe and optimal Balance correction
- Minimum to no complications
- Strategic Segmental instrumentation
- Procedure should be tailored to the patients' needs and the expertise of the surgeon.
- Improvised treatment for tangible and acceptable outcome

# ... by effectively mobilizing international resources

## Volunteers

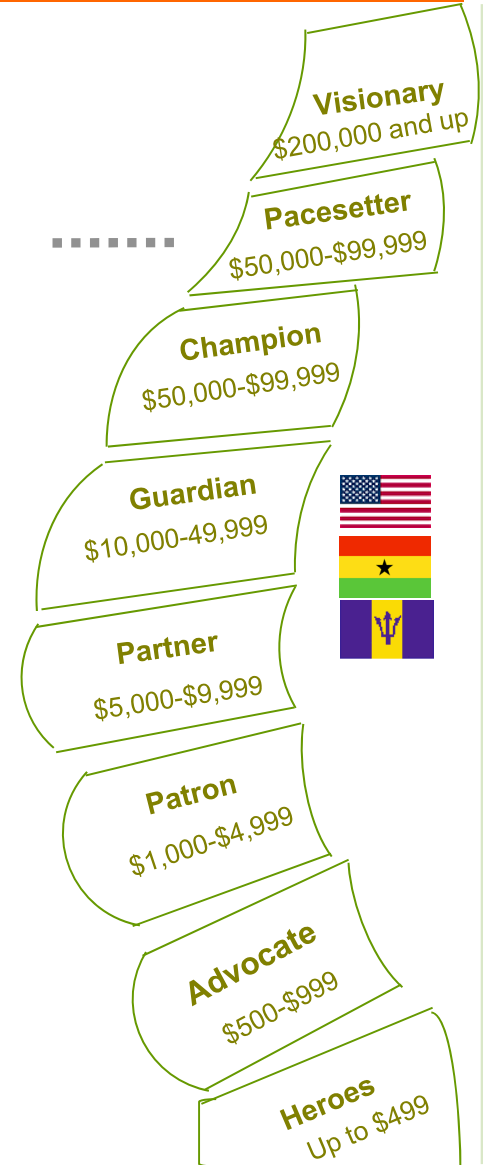


Teams include physicians, physician assistants, nurses, physical therapists, orthotists

## Infrastructure Contribution



## Donor Base



**Stavros Niahos Foundation**



**Biotronics**

**America Jewish Foundation**

**FOCOS**

FOUNDATION OF ORTHOPAEDICS AND COMPLEX SPINE

**DePuySpine™**  
a Johnson & Johnson company

**Medtronic**  
SOFAMOR DANEK

**zimmer**  
Confidence in your hands™

**LENOX MACLAREN**  
SURGICAL INSTRUMENTATION DESIGN & FABRICATION  
Walter Feinberg®



**Medtronic**

**OSTEOTECH**  
Innovations in Musculoskeletal Science

**WRIGHT FILIPPIS**

**SYNTHES**  
Spine

**K2M**  
COMPLEX SPINE INNOVATIONS™



# FOCOS GHANA MISSION VOLUNTEERS - 1998-2009

## TOTAL VOLUNTEERS 184

Year	# of volunteers
2009	60(est.)
2008	54
2007	59
2006	29
2005	30
2004	23
2003	22
2002	16
2001	5
2000	11
1999	7
1998	3

Volunteers Served	# Served since 1998
Surgeons	63
Nurses	39
Anesthesiologists	5
Medical	2
Physiatrists	2
Medical Specialists	1
Neurophysiologists	11
Physical Therapists	12
Orthotists	4
Physician Assistants	4
Surgical Tech	7
Medical Students	9
Manufacture Reps.	7
Research	5
Non-Medical	13

# FOCOS GHANA Surgical LOG

## 1998-2009

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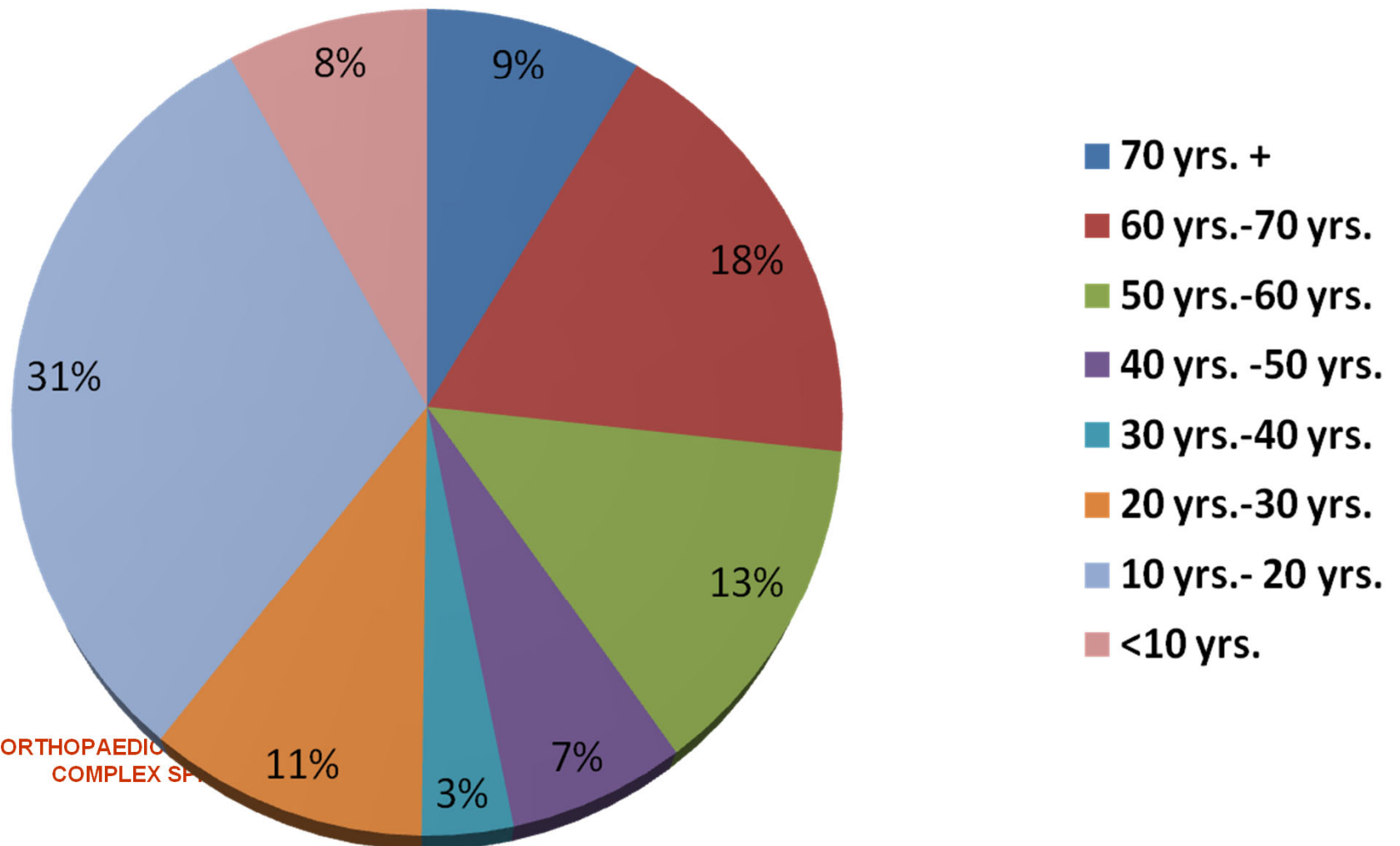
### SPINE

SURGERIES	DIGANOSIS	# CASES
	Scoliosis	123
	Spondylolisthesis	23
	Spinal Stenosis	50
	Kyphosis	76
	Kyphoscoliosis	24
	Lumbar Stenosis	2
	Spondylosis	7
	Other	48



# FOCOS GHANA OPERATED PATIENTS'S AGE 1998-2009

Patients' Age



## Treatment Options Utilized to Date

---

- Cast or Brace (Temporary)
- Posterior Procedures
- Combined Anterior/Posterior
- Growing Rods (Dual Rod)
- Growth Guided ( Modified Shilla)
- Do Nothing

# Cast Molds and Braces

---



# Case Histories with FOCOS Operative Index

FOCOS LEVEL and Operative Index	Descriptive example
1	Single curves < 80Deg , ASA 1
2	Double curves <80deg, ASA 1 Kyphosis <90 deg; Anterior curve correction
3	Flexible Curve (S) >90 Deg : ASA 1-2
4	Rigid curves req, Osteotomies ASA >2 Hemi-Vert Resection
5	Combined procedures, ASA>2 Resection procedures (PVCR)

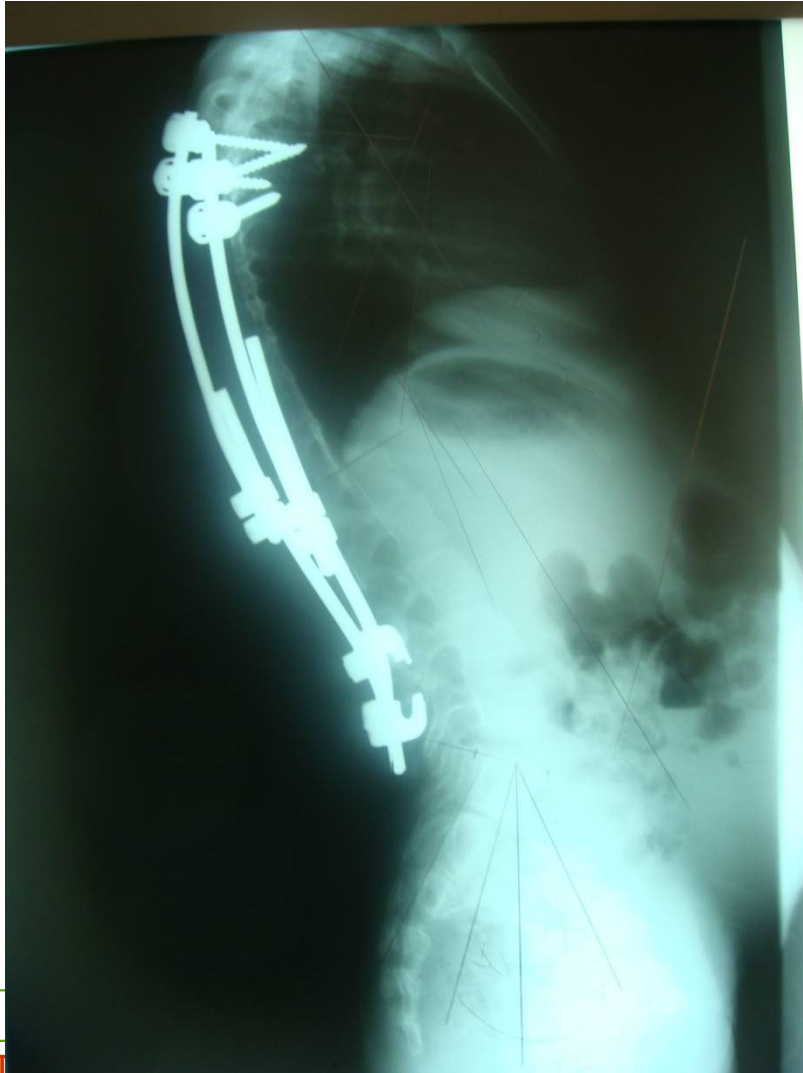


## Quaye, Vivian (GH) 11-07

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# 1 year Post op Dual ROD 12-08 Ext to T1

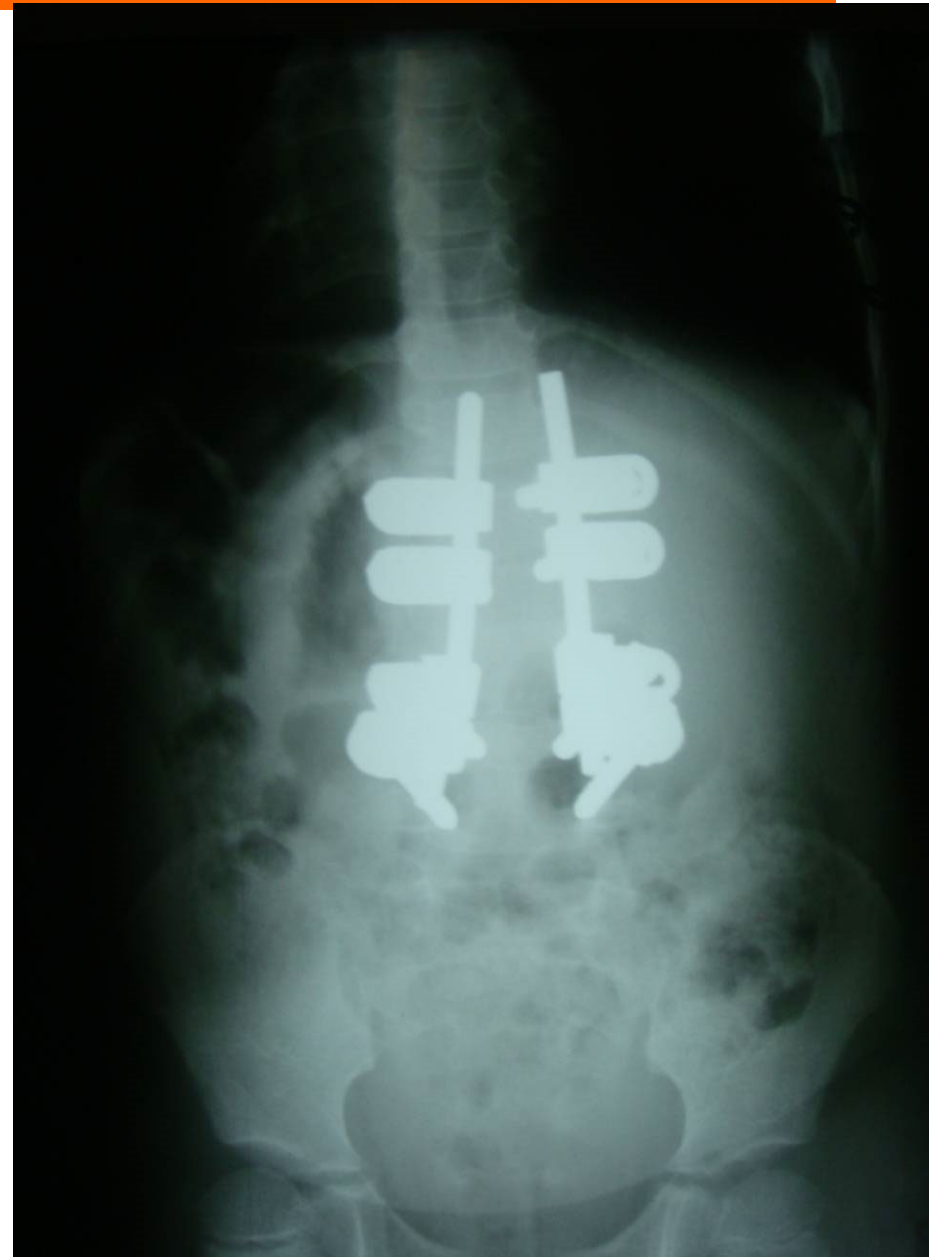




# Aryeh 4YF PSF L1-L5 (Level 1)



# Aryeh 4YF PSF L1-L5 (Level 1)



# EA : 1 Yr Post Op





# Antwi 2M Progressive Kyphosis



# Antwi Age 3

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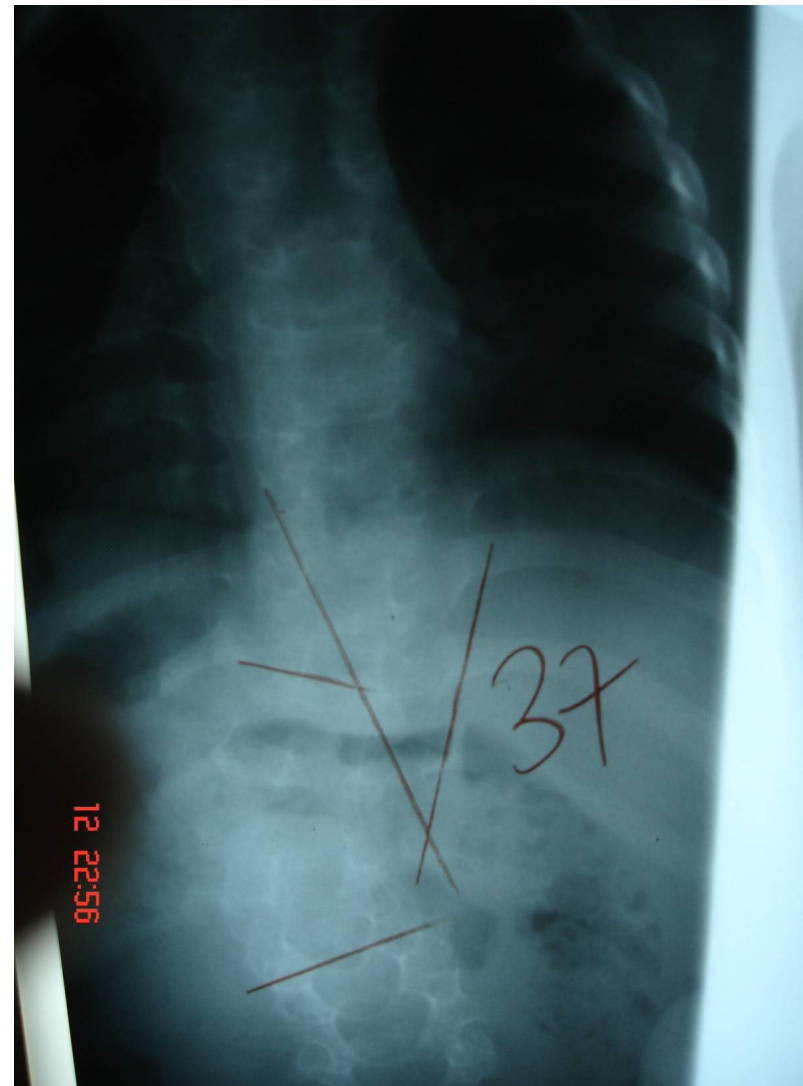
PAEDI  
COMPLEX

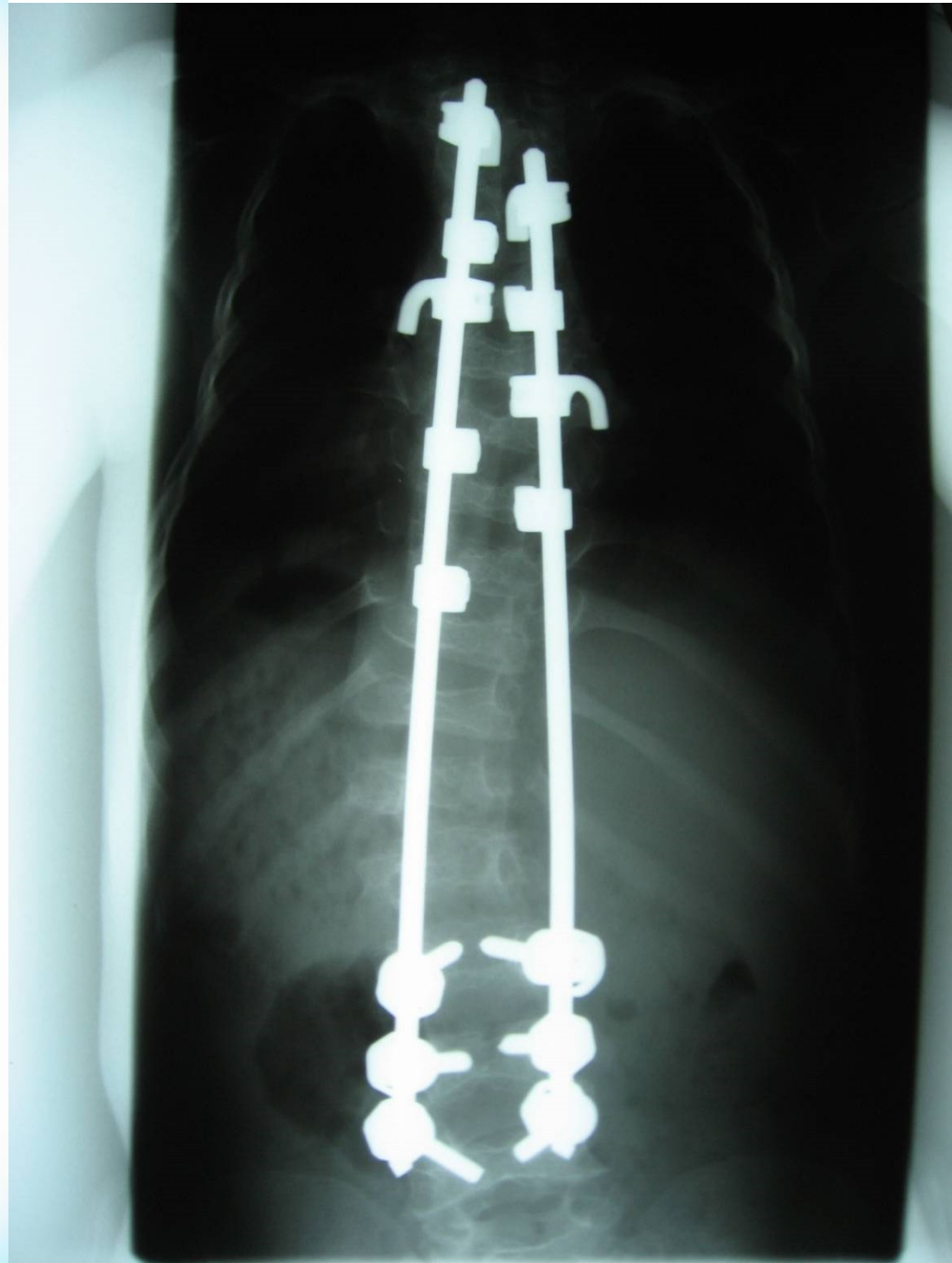
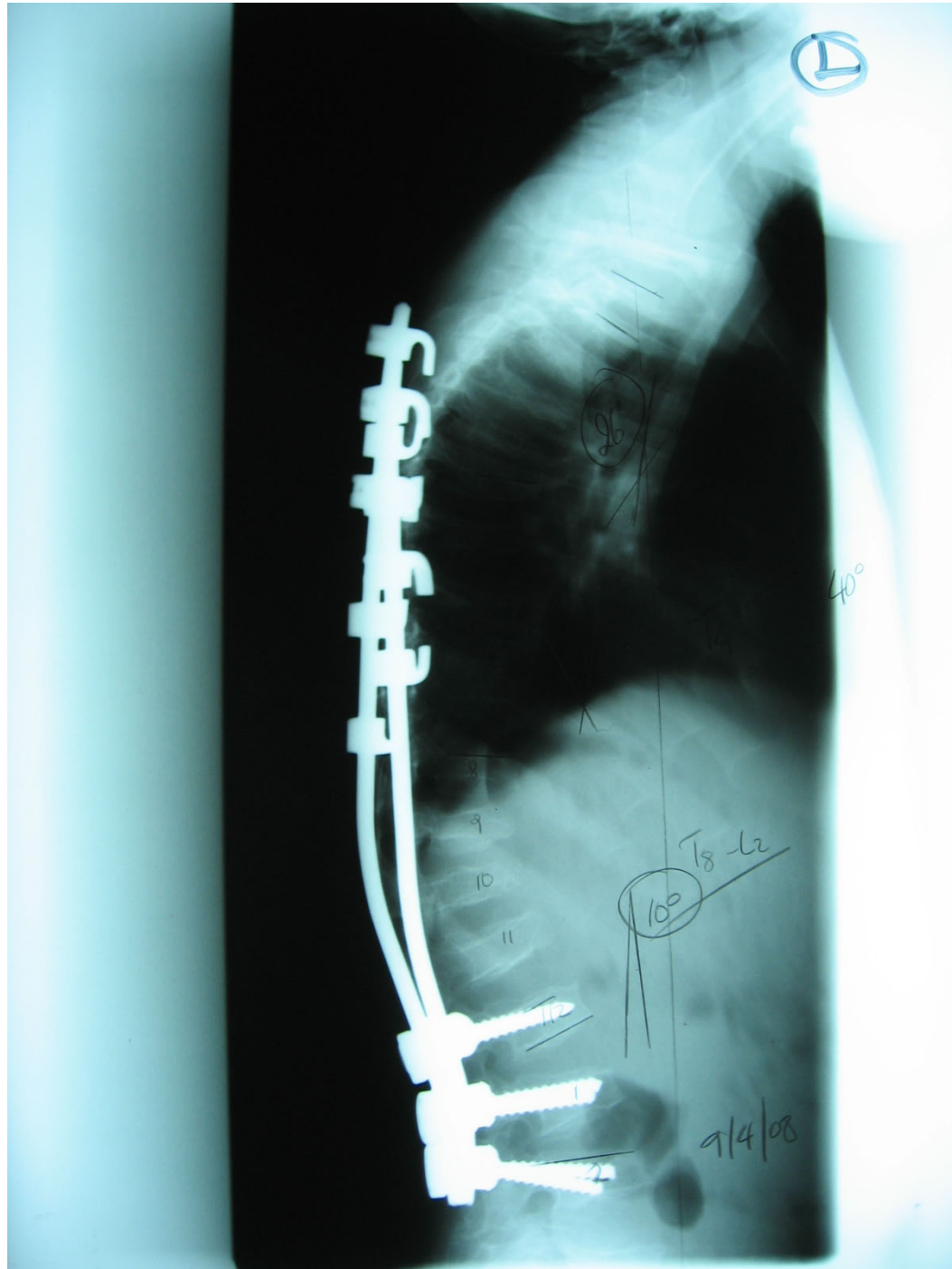




**11-17-06**  
**PSF T3 to L4 / Pedicle screws L4,3,2 bil. (Level 2)**

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# Betelehem Markose Genedo (ET) 5F

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## Betelehem Markose Genedo (ET)

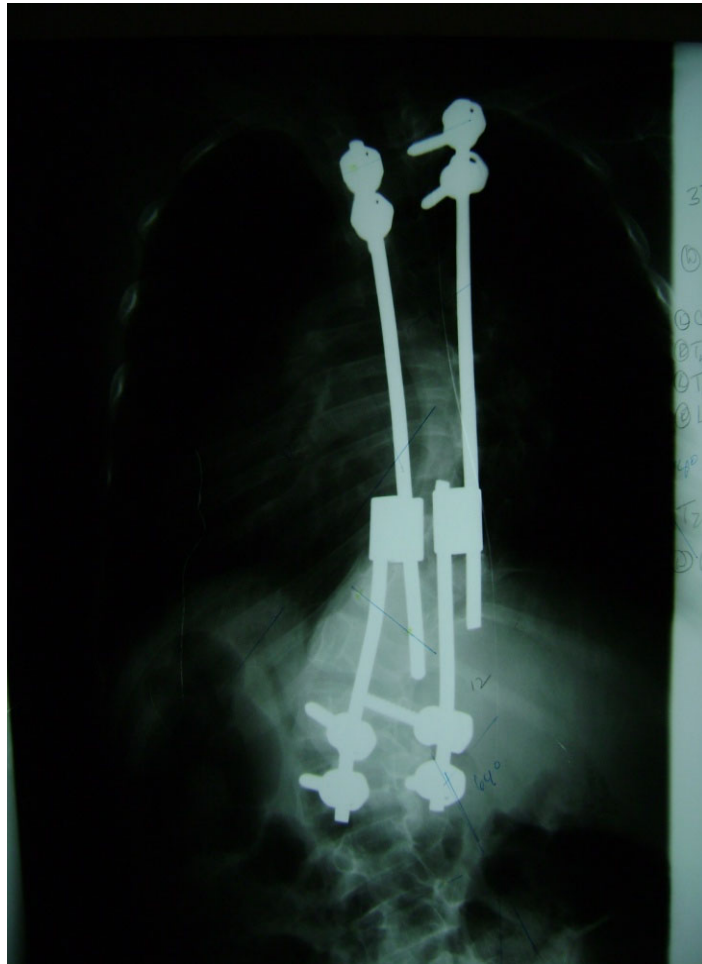
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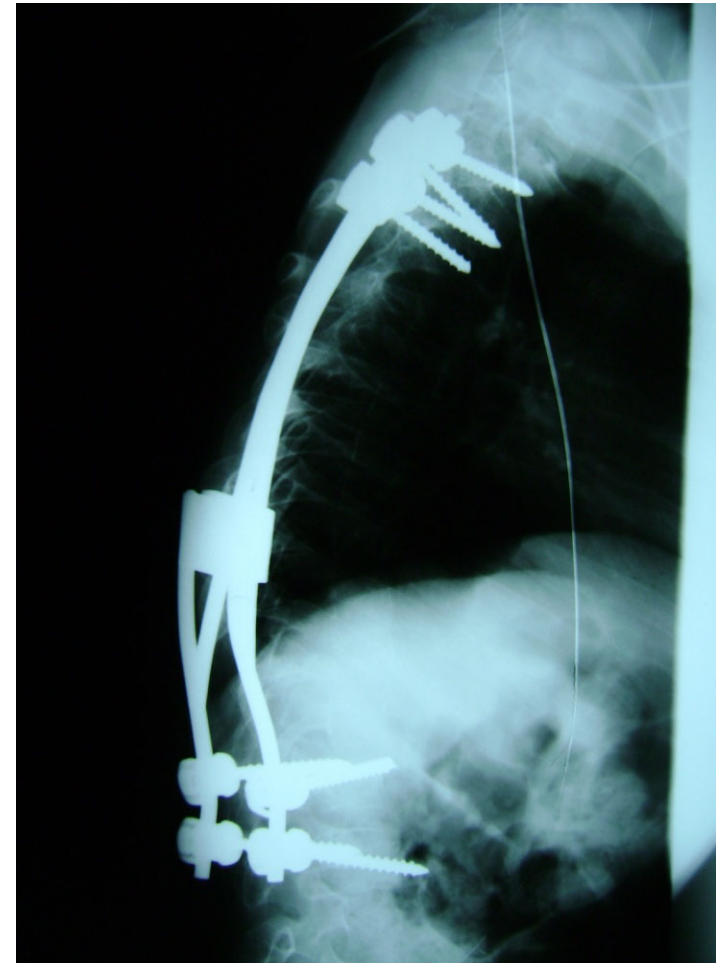


## BM :ET Dual ROD (Level 2)

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**Pre-Op**  
**With instrumentation**



## Betelehem Markose Genedo (ET)

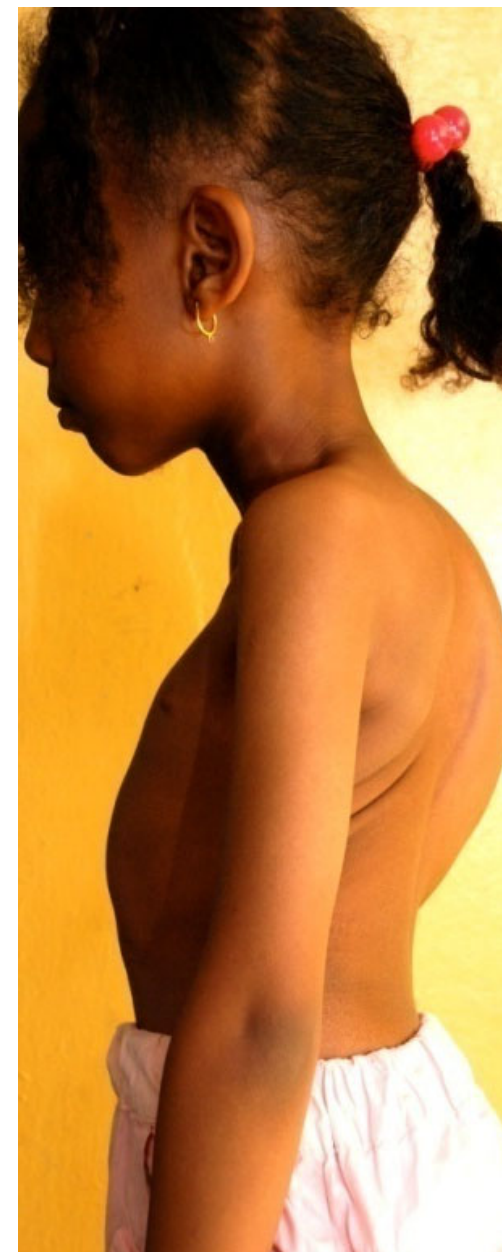


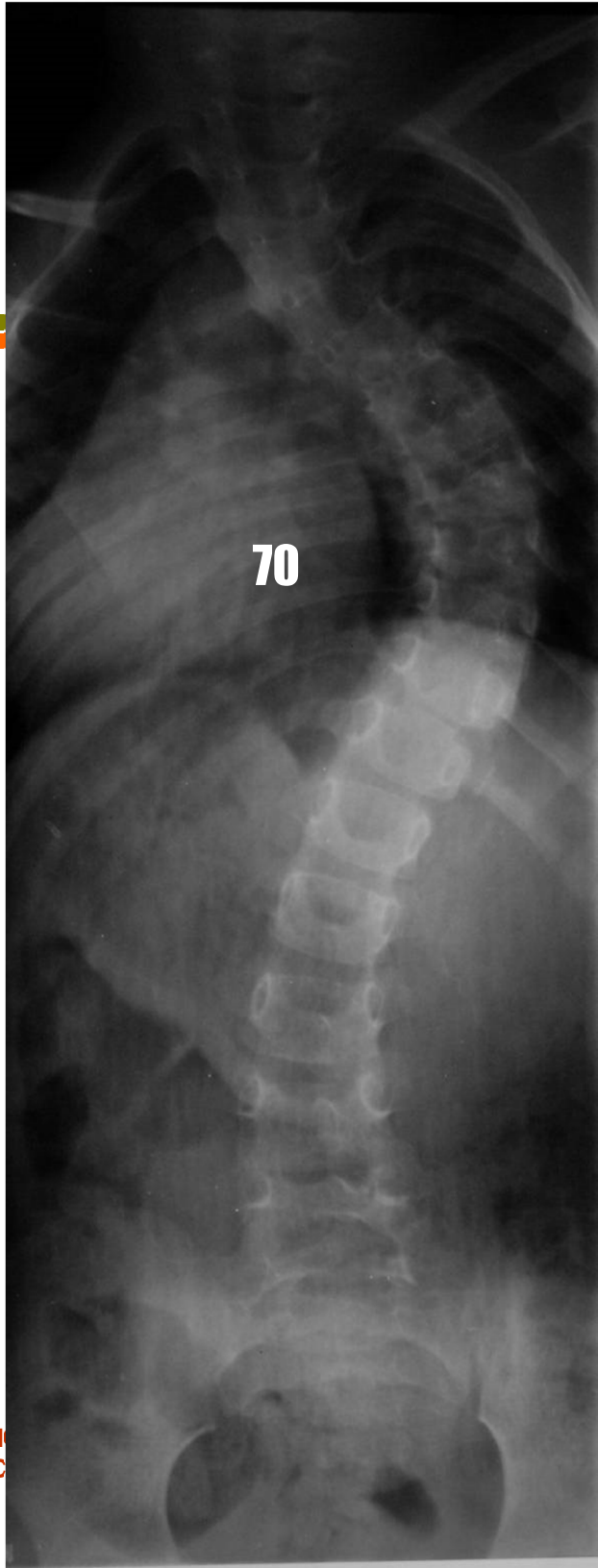


# BBF, 6F, FVC 49% ( Level 3 )



S AND  
SPINE

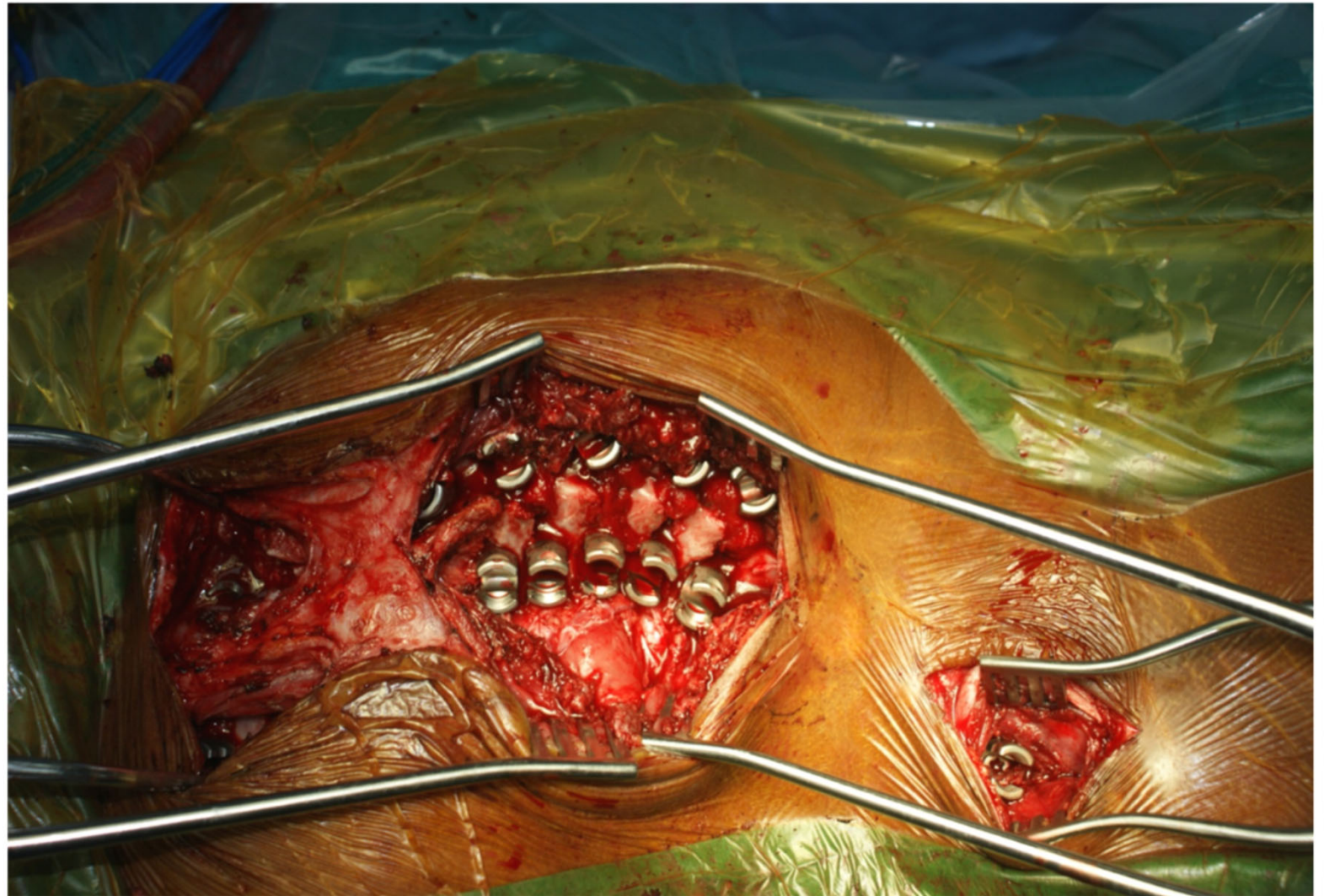






## INTRA OP: ALL SCREWS IN

---



# Post- Op PSF Modified Shilla 12-08

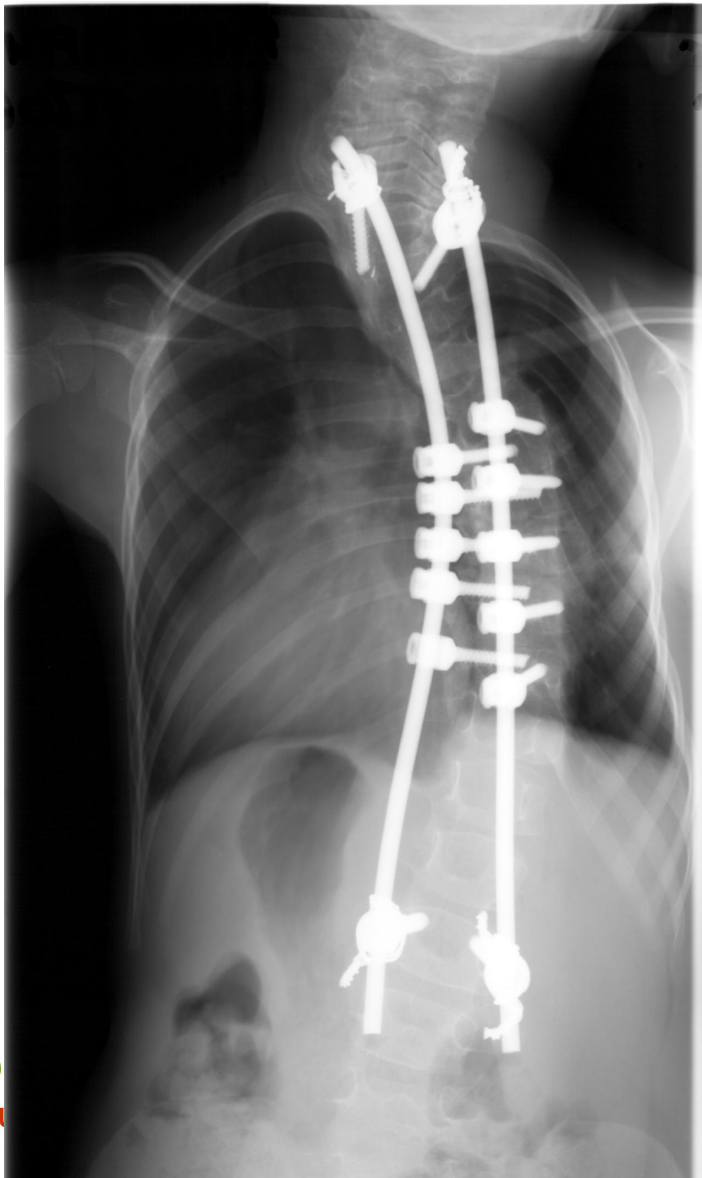






## Post- Op Revision Upper foundation

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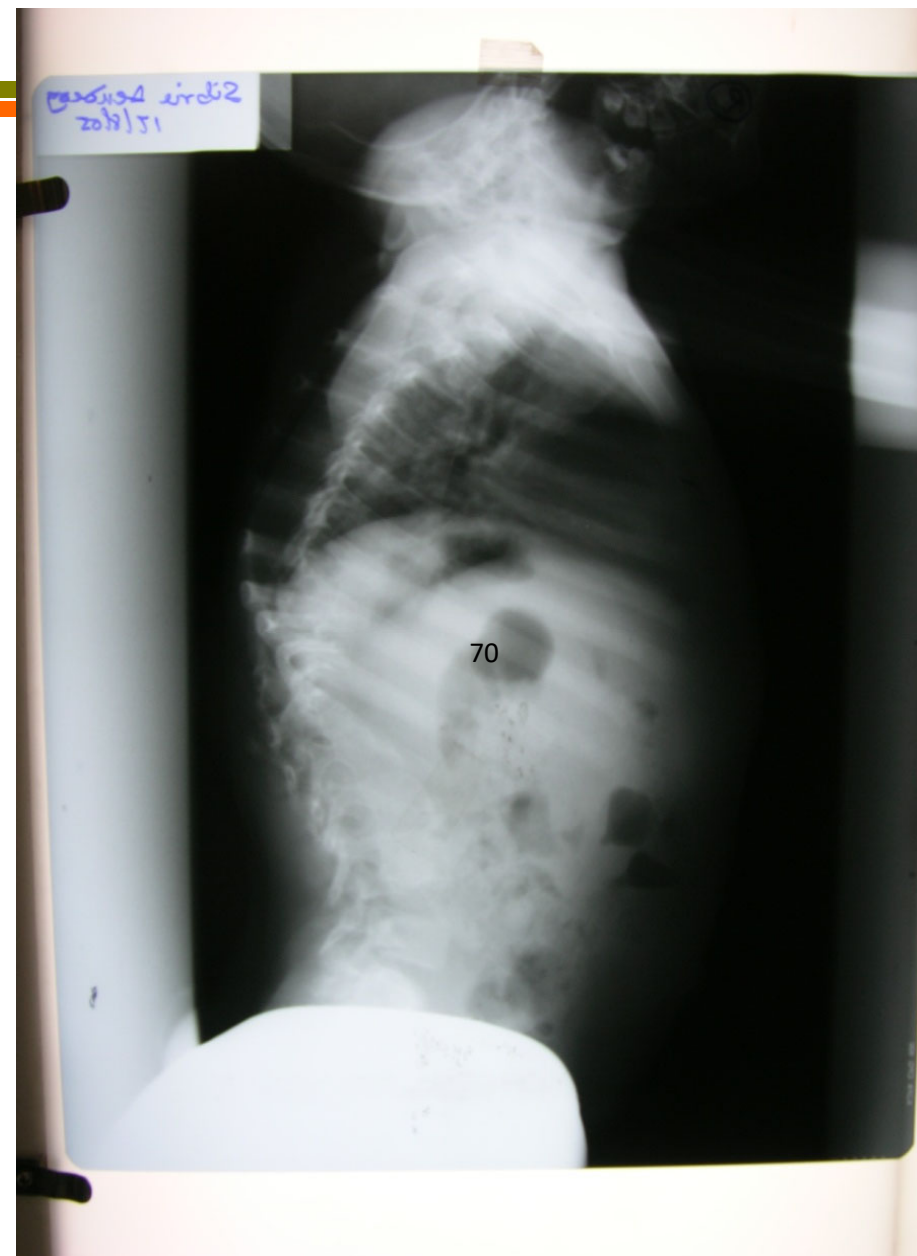
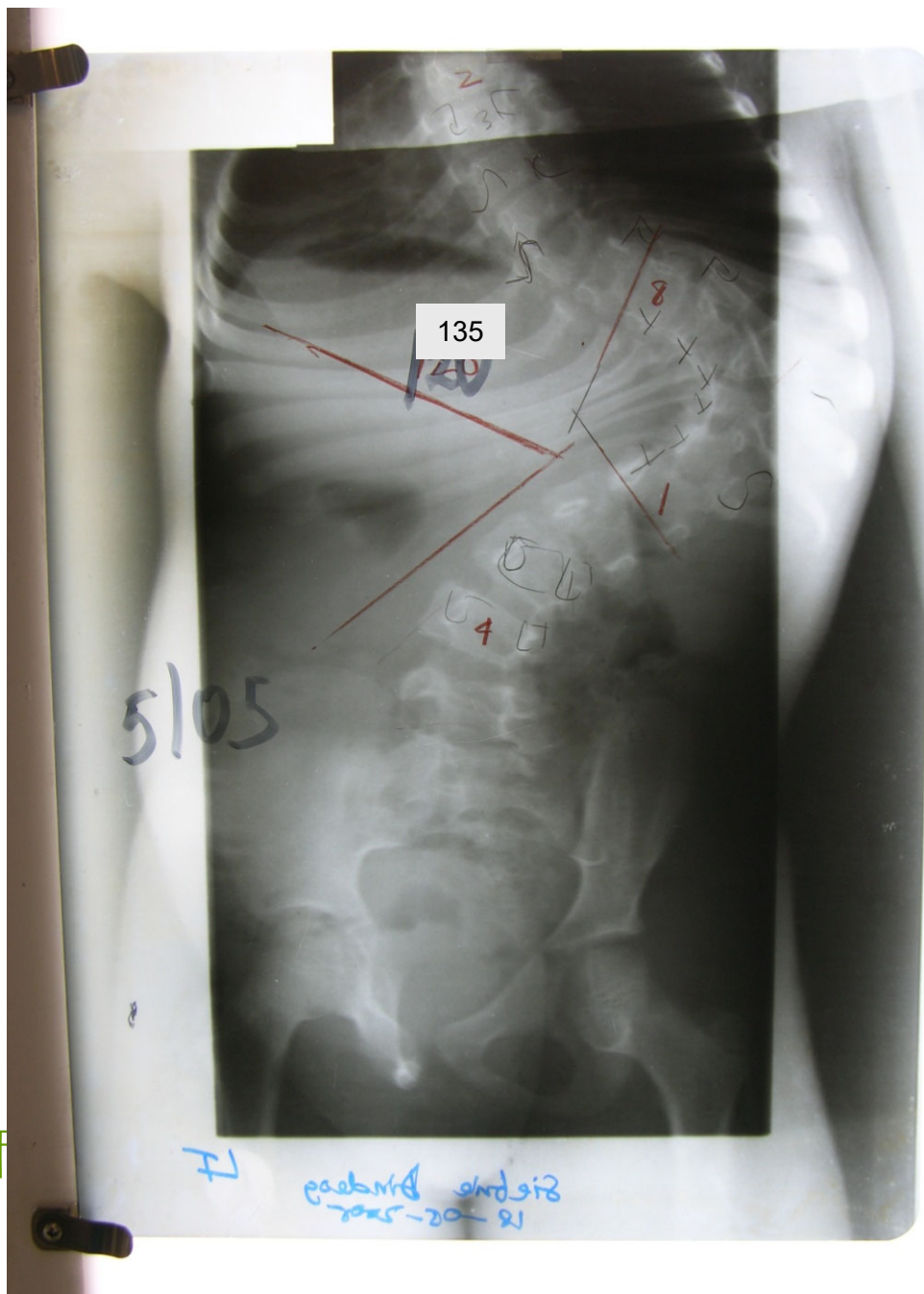
# Post op Extension of Rod



# SD 8F Untreated EOS









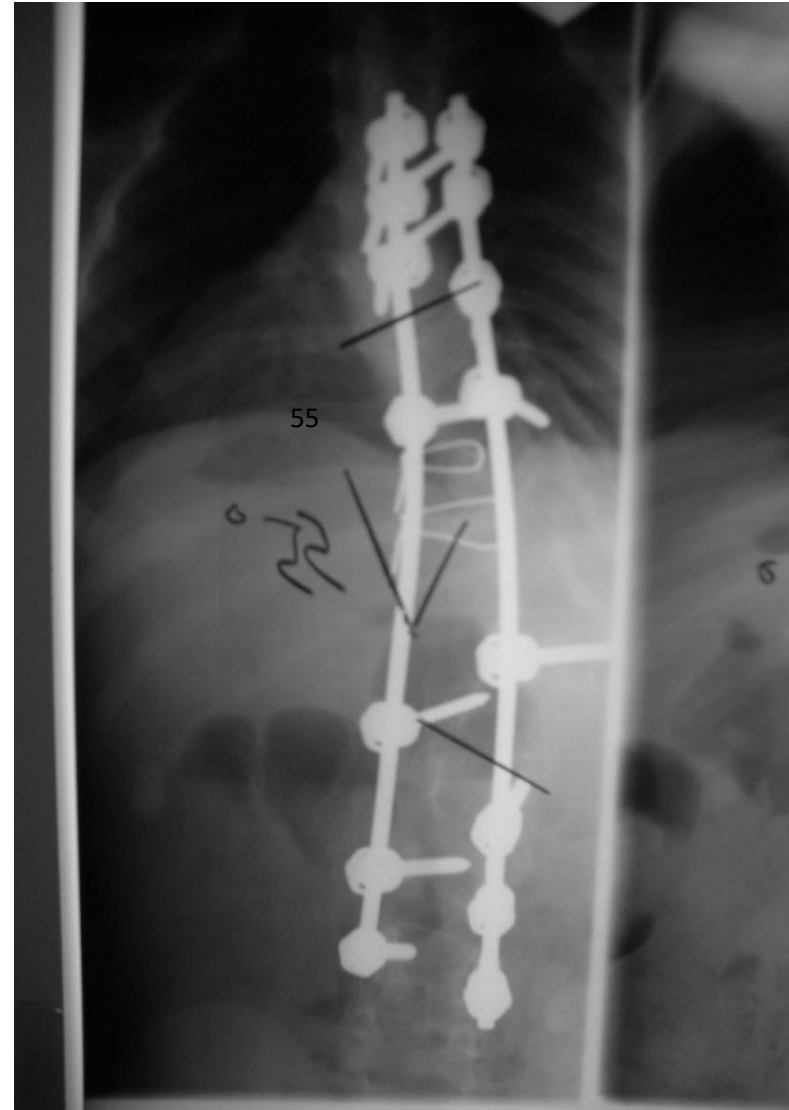
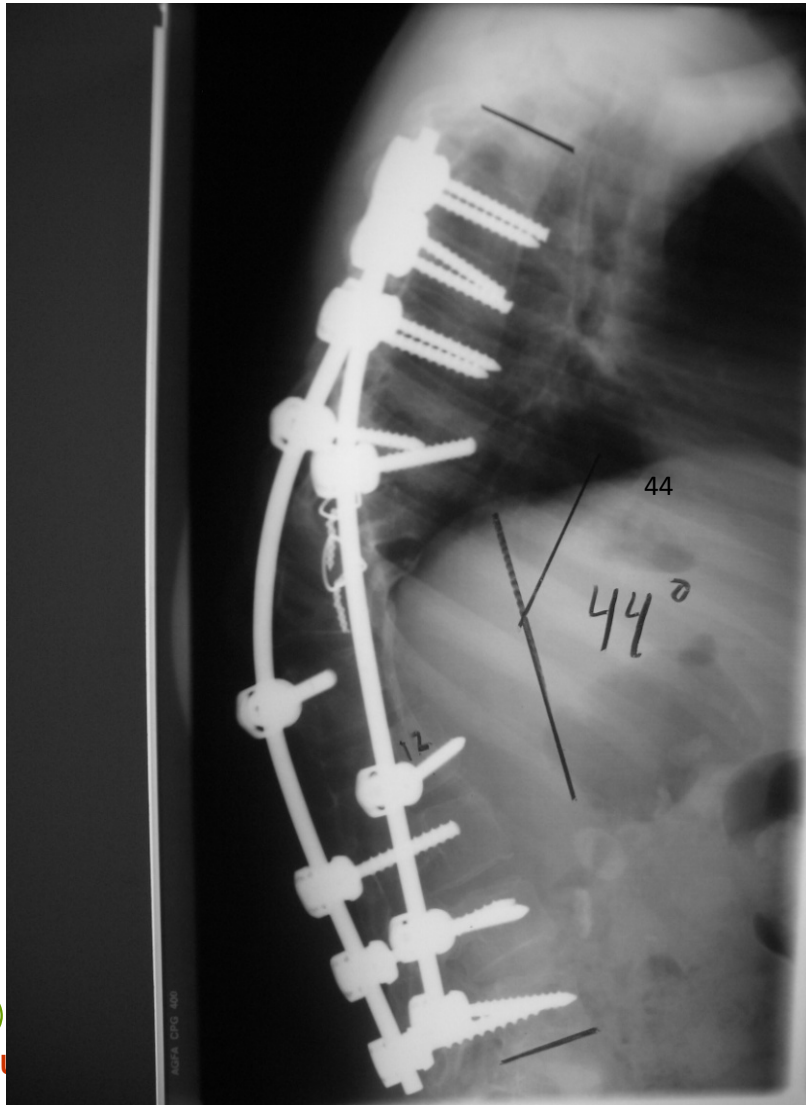
# Traction failed initial anesthetic intubation and Reschedule



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## PSF concave rib osteotomy , Thoracoplasty (Level 3)



# 4 years Post Op

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## BB Brothers

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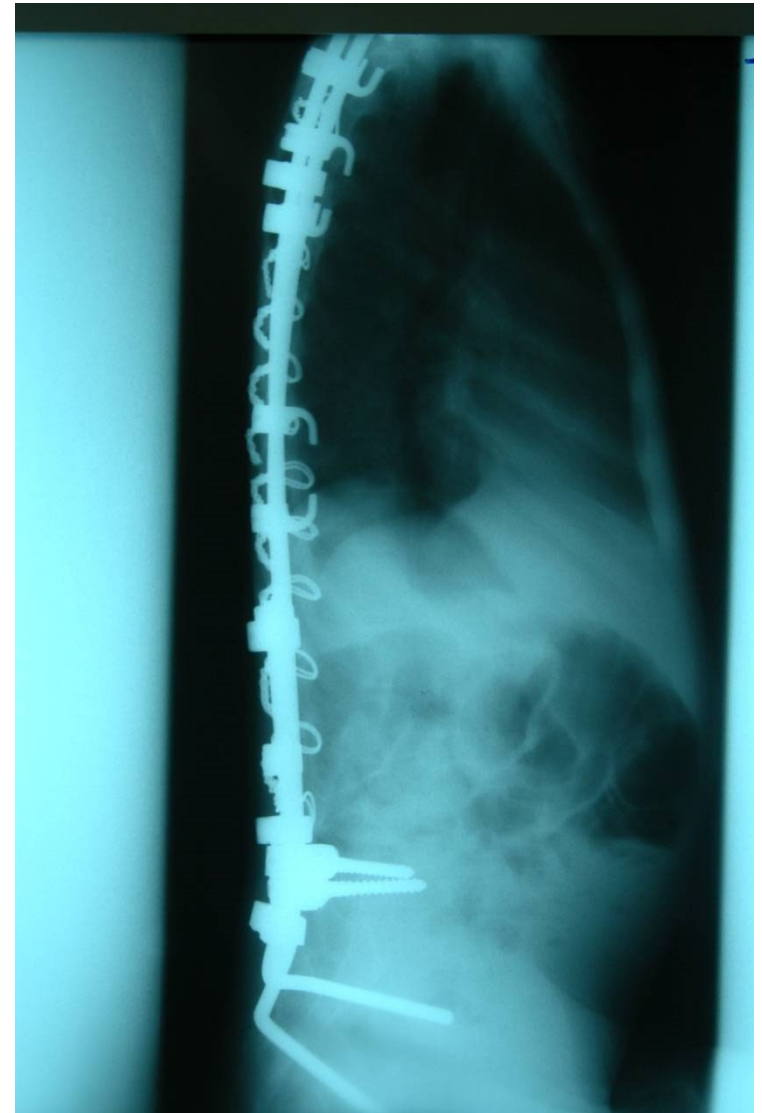
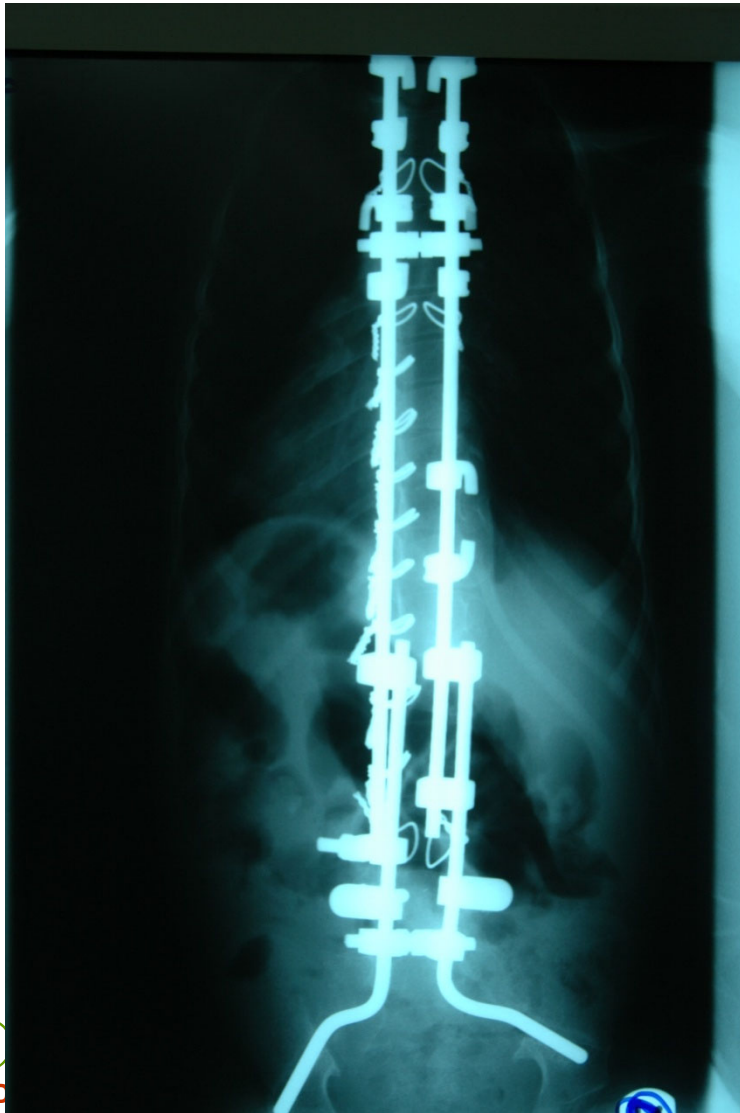






# BB 8YM 2004 poop (Level 4)

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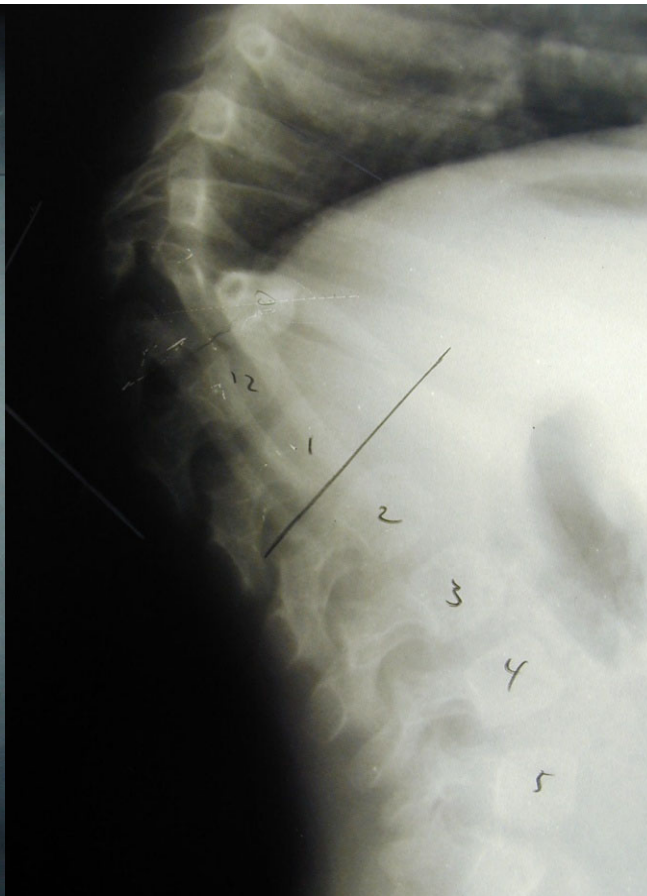
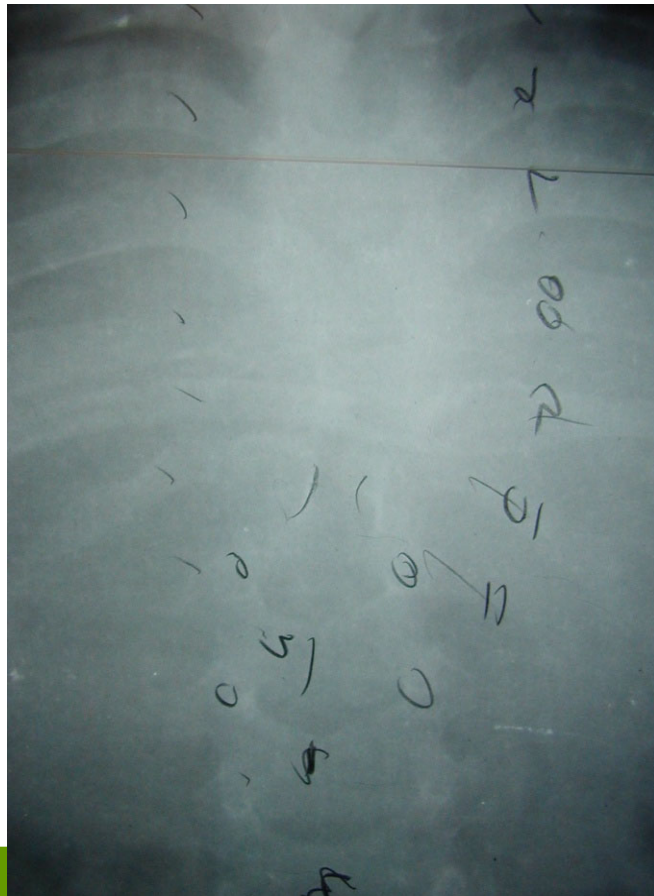


## 2 years Post op Travelled to US and 2 of the brothers died of pulmonary complications

---



# Abankwa 2YM





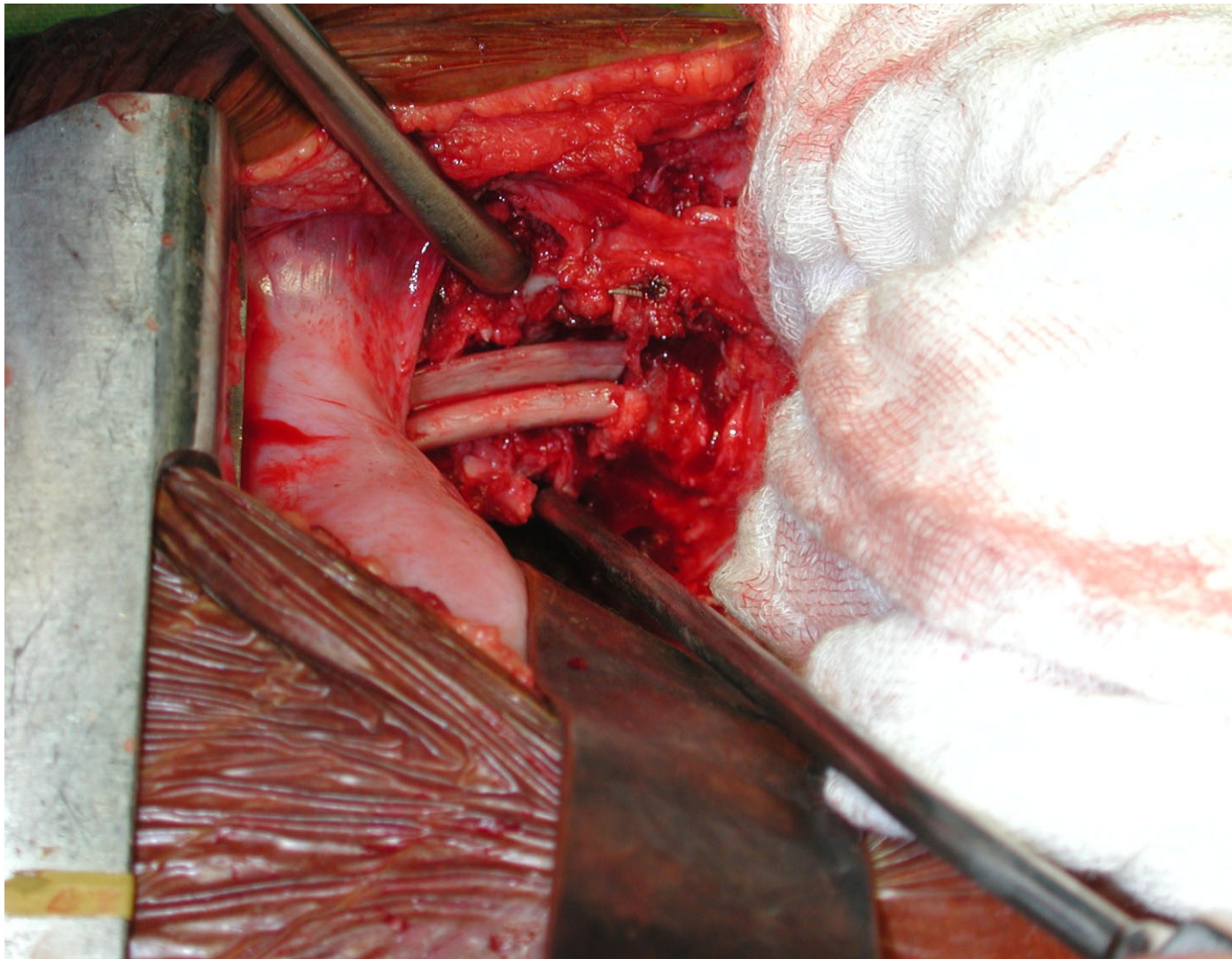


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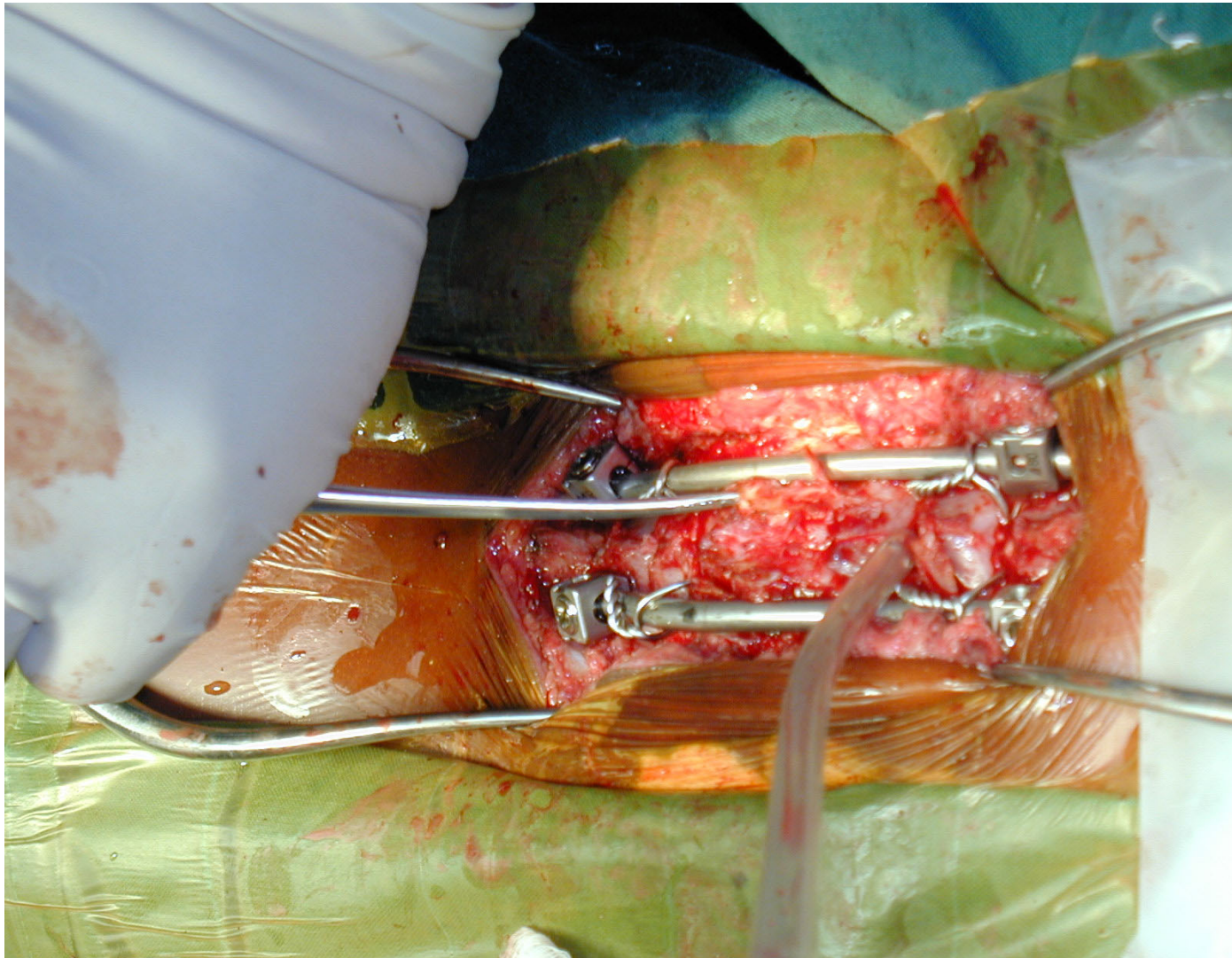
## ASF Strut grafts

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# 1 Stage ASF/PSF ( Level 5)

---

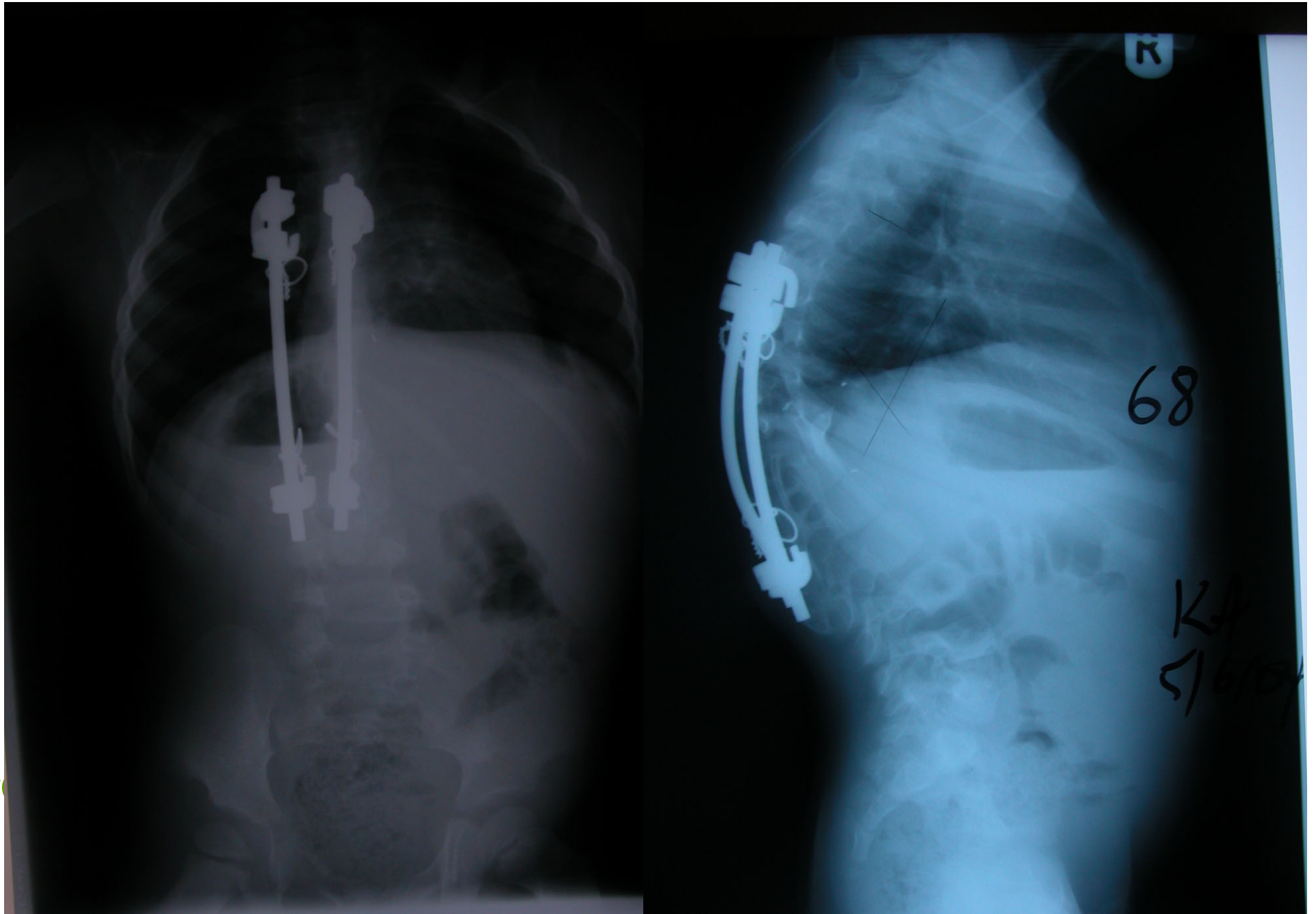




2004

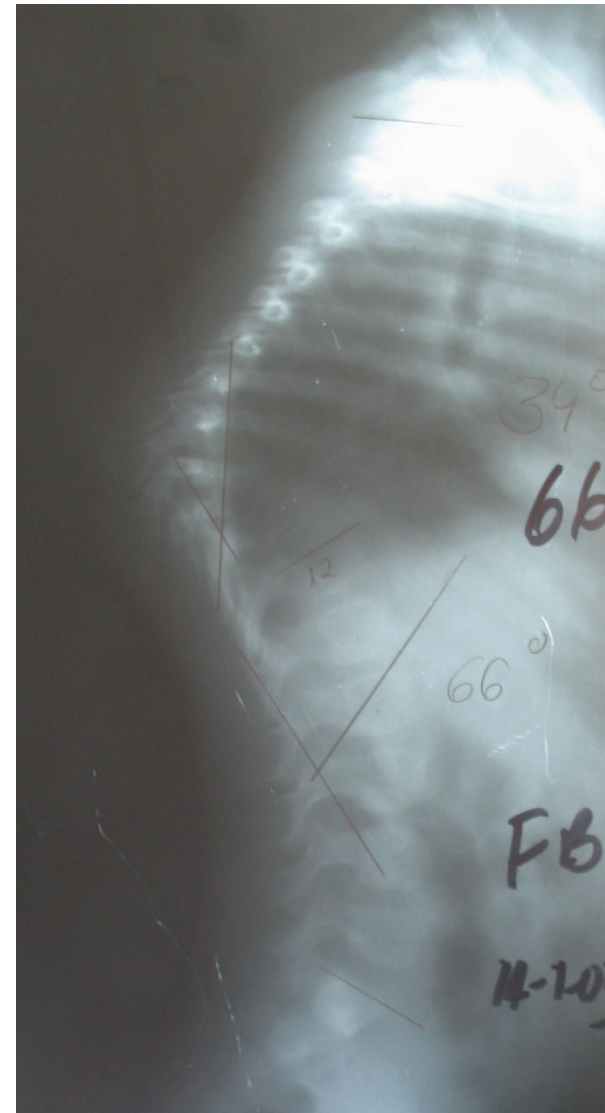


2004



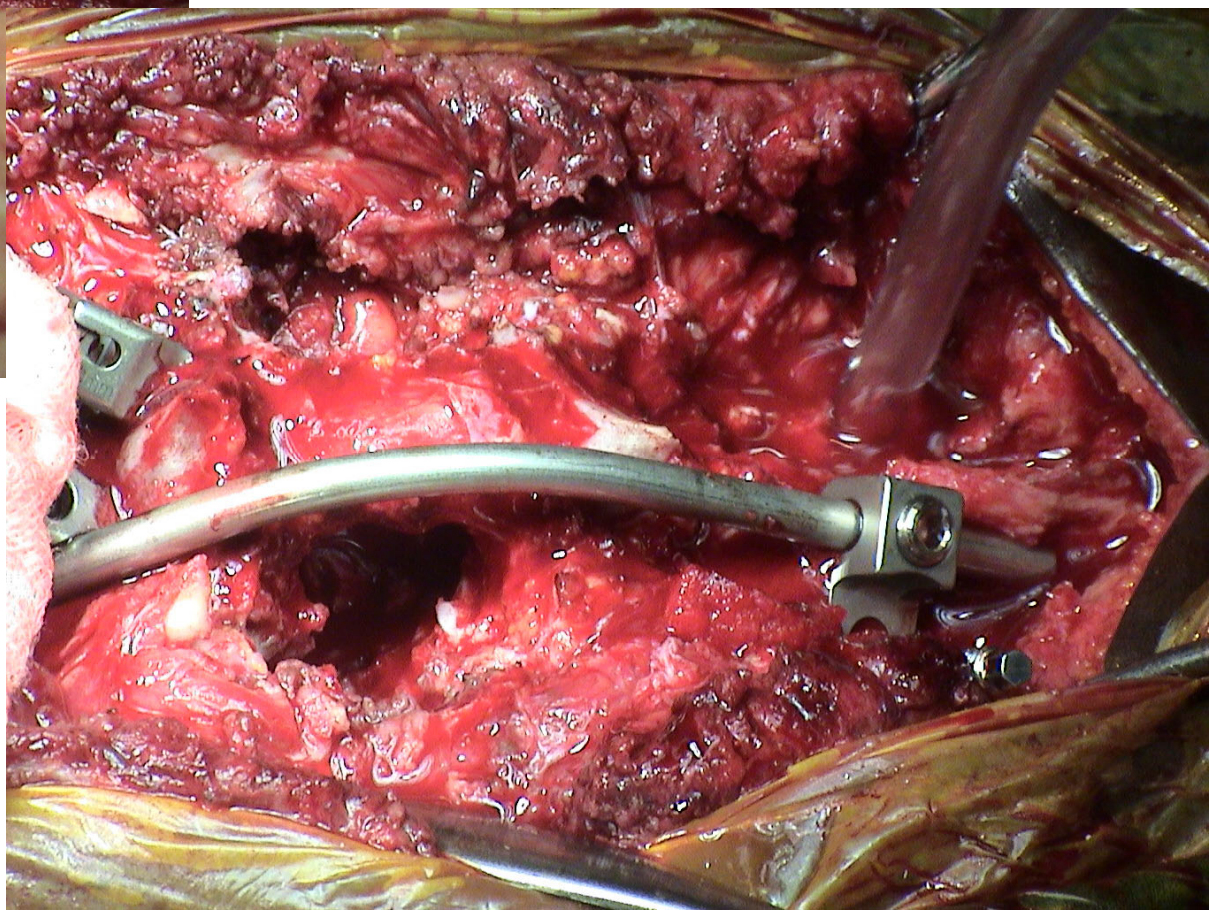
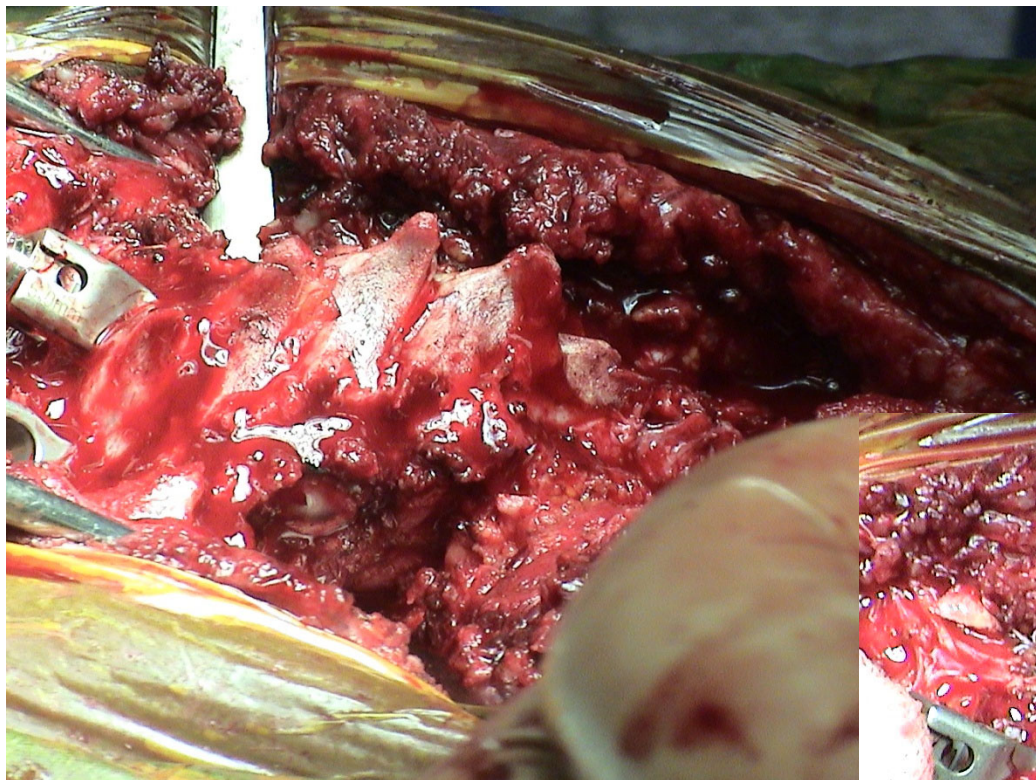


# FK 5F Kyphosis





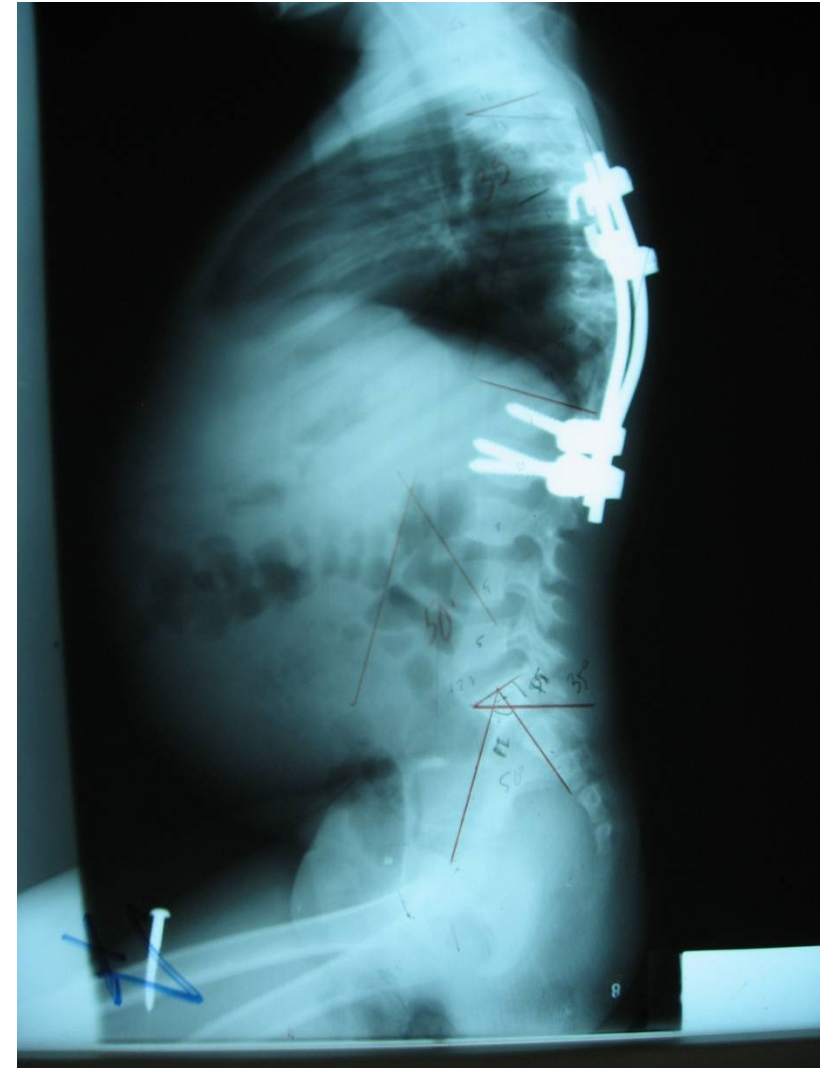
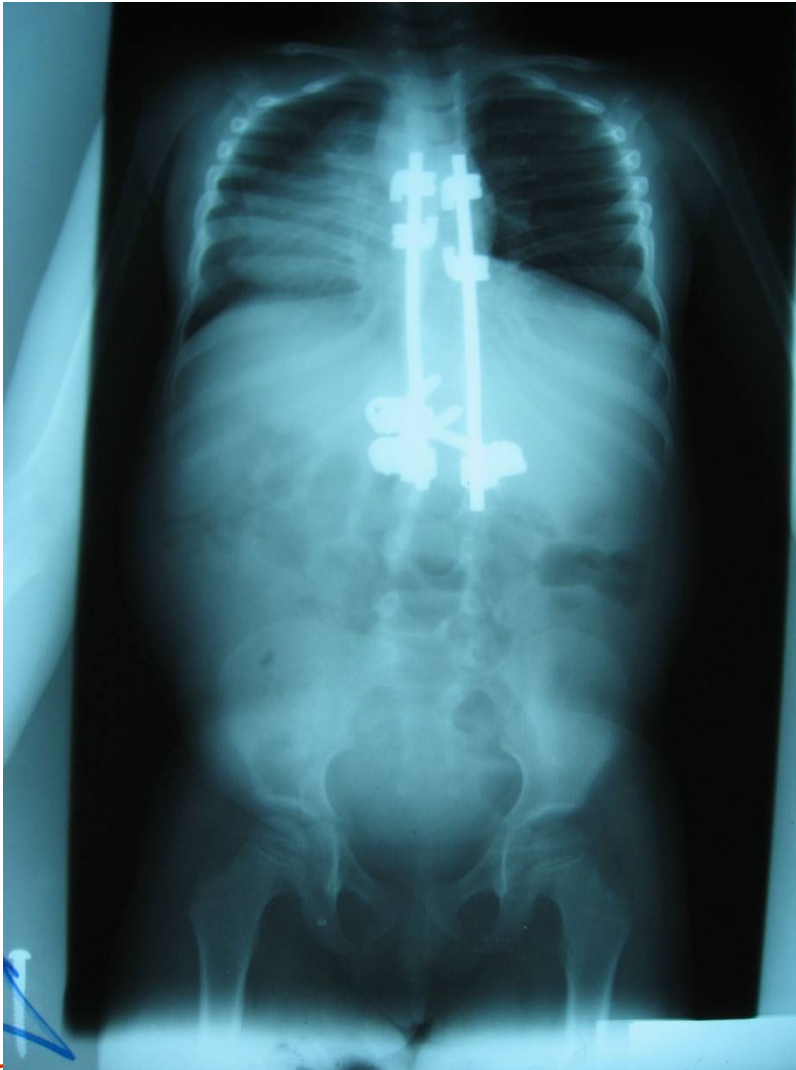
## PVCR (Level 5)



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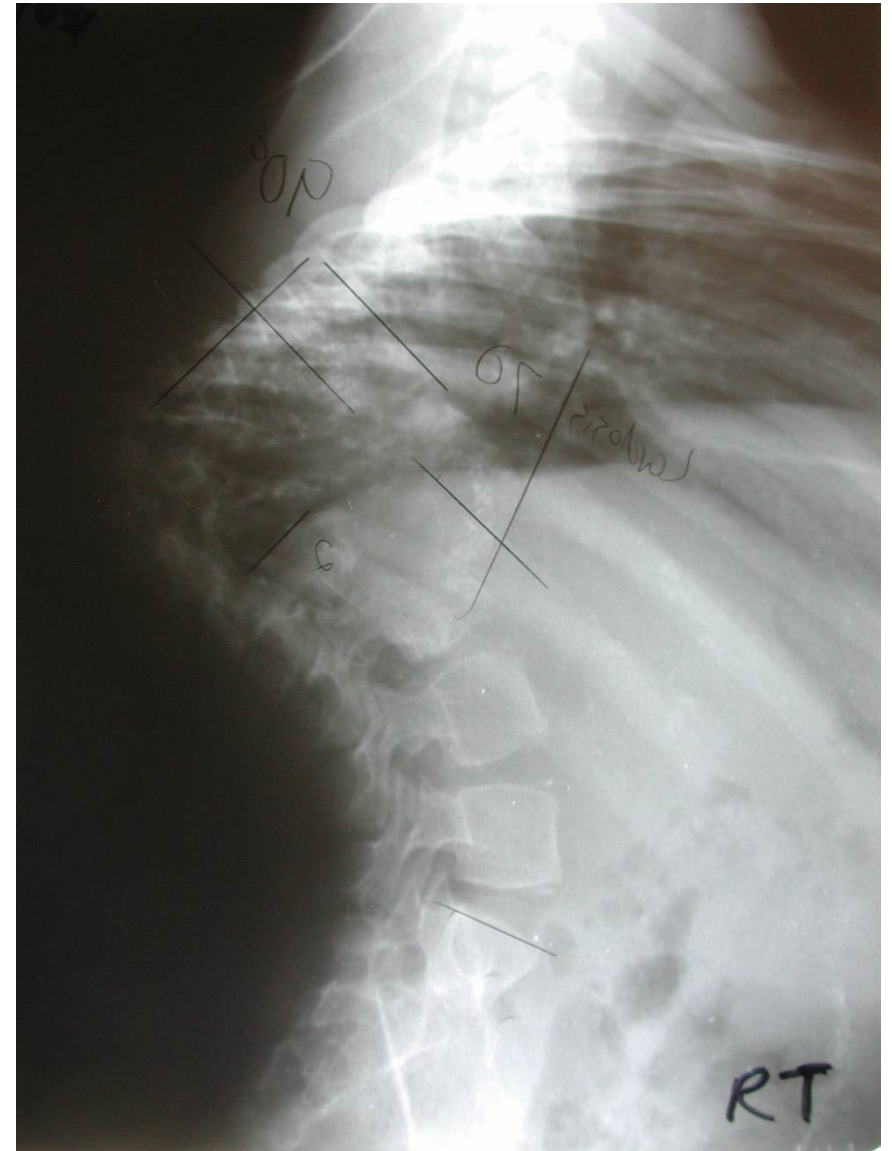




FOCUS

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FOC

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# Happy Post Op

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## 3F with unknown Musculoskeletal disorder and kyphosis



## 3F with unknown Musculoskeletal disorder and kyphosis –



## Complications Patient 1-9years (#30pts)

Diagnosis	Number	Neuro	Deaths	Implants
<b>Scoliosis</b>	<b>12</b>	<b>1</b>	<b>3</b>	<b>4</b>
<b>Kyphosis</b>	<b>18</b>	<b>1</b>	<b>1</b>	<b>3</b>
<b>Total</b>	<b>30</b>	<b>2</b>	<b>4</b>	<b>7</b>

Neuro: Cord Level; 1 Partial recovery  
 2 Deaths: 2yrs Pop (NM pts)  
 2 Related to Malaria 6 months ost op

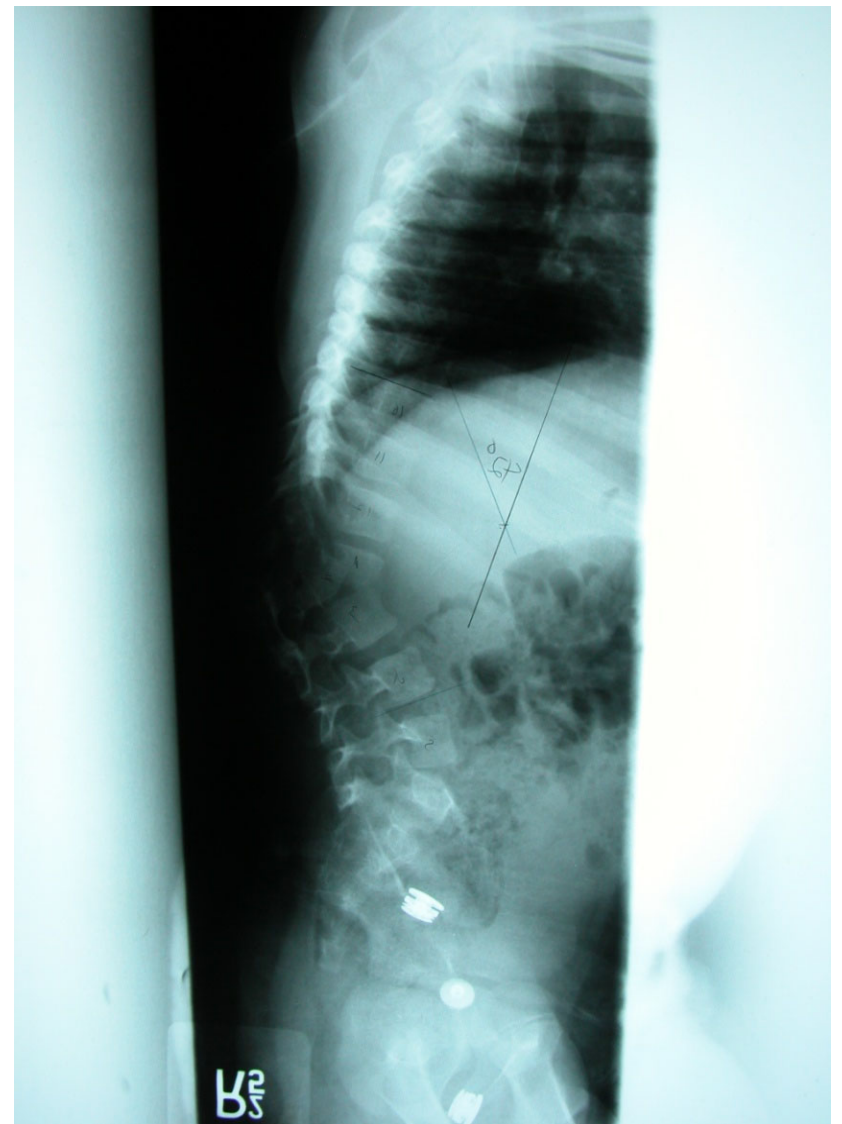


## CM 2004

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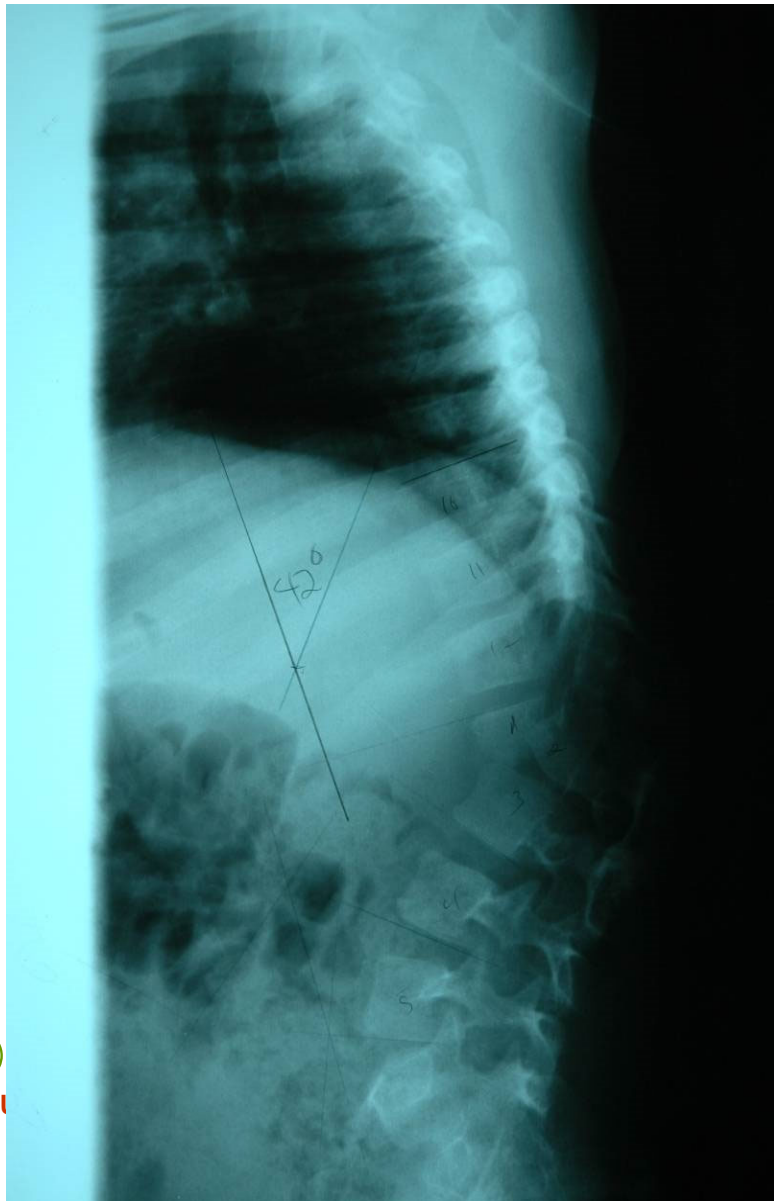


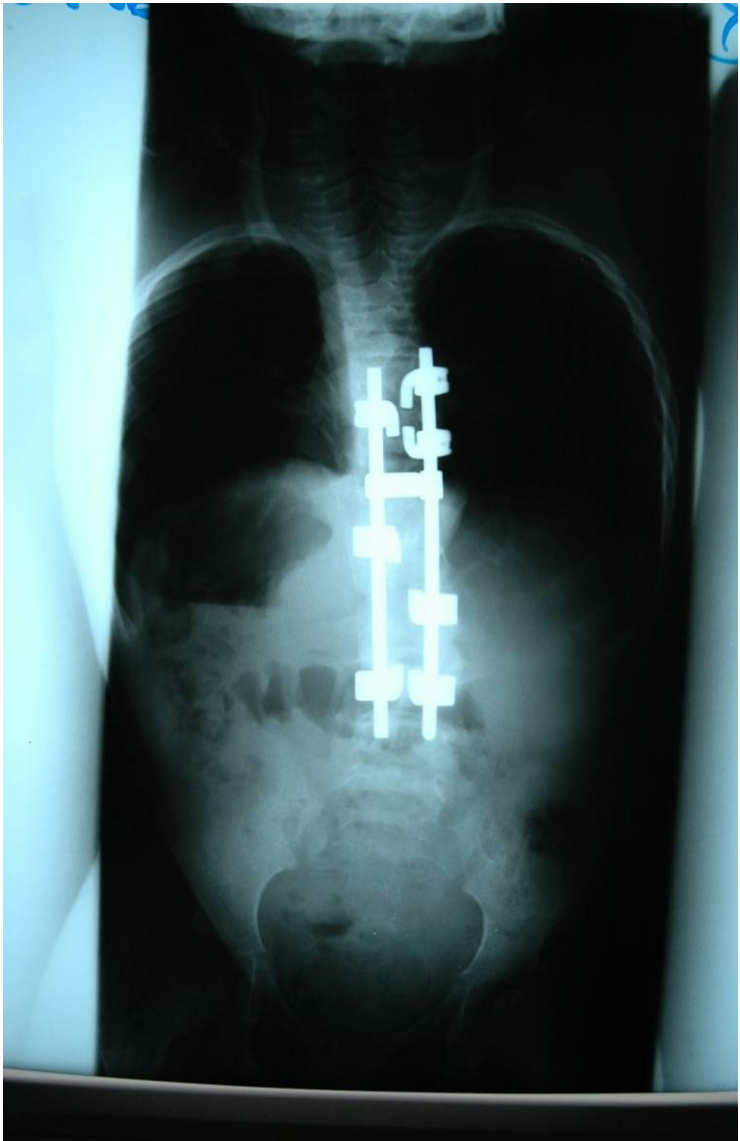
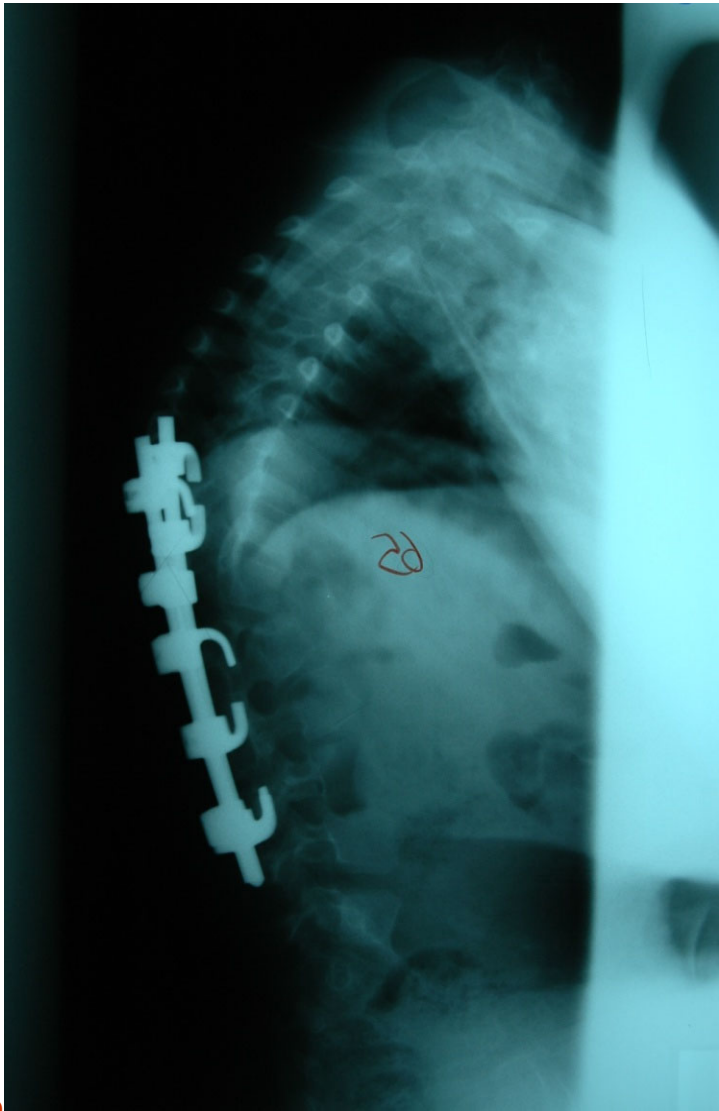
COMPLEX SPINE



## CM 5 Congenital kyphosis paraparesis 2005

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## Cm Pop 1 2005

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Page 10 of 10



# Conclusions

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## ■ ISSUES TO ADDRESS

- Early recognition is a problem in underserved areas
- No Option for casting/Bracing
- Lack of sophisticated implants may compromise care
- Periodic surgeries not well tolerated by patients from long distances to a central location
- Multidisciplinary care unavailable for complex co-morbidities



# Conclusions

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- In a safe and relatively cost-effective manner, and without compromise, patients with Early onset Spine Deformity in the developing countries can receive the benefits of timely

# THANK YOU

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