Možnosti využití modelu páteře při operacích vrozených skolióz u dětí.

Filipovič M. (1), Leznar M. (1), Sklenský J. (1), Repko M. (1)
Maxová M. (2), Mikulka J. (3), Říha K. (3), Chalupa D. (3)

(1) Ortopedická klinika LF MU a FN Brno
(2) Klinika radiologie a nukleární medicíny LF MU a FN Brno
(3) VUT Brno

Spondylochirurgické centrum FN Brno
Ortopedická klinika LF MU a FN Brno
Přednosta: prof. MUDr. Martin Repko, Ph.D.

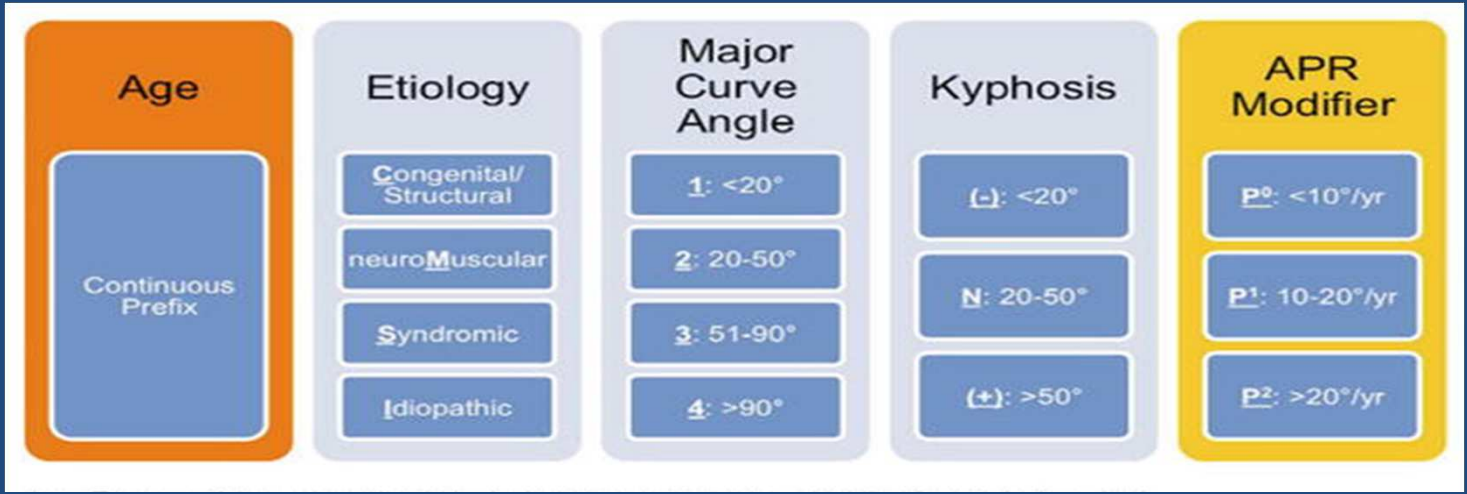
IX. SPINÁLNÍ KONGRES
4. – 5. listopadu 2021 Mikulov, hotel Galant

Podpora projektu

Příspěvek je podpořen grantem AZV

Registrační číslo projektu NV 18-08-00459

Early-onset scoliosis (EOS)



Williams BA, Matsumoto H, McCalla DJ, Akbarnia BA, Blakemore LC, Betz RR, Flynn JM, Johnston CE, McCarthy RE, Roye DP Jr, Skaggs DL, Smith JT, Snyder BD, Sponseller PD, Sturm PF, Thompson GH, Yazici M., Vitale MG.

Development and initial validation of the Classification of Early-Onset Scoliosis.
J Bone Joint Surg Am. 2014 Aug 20;96(16):1359-67. doi: 10.2106/JBJS.M.00253.

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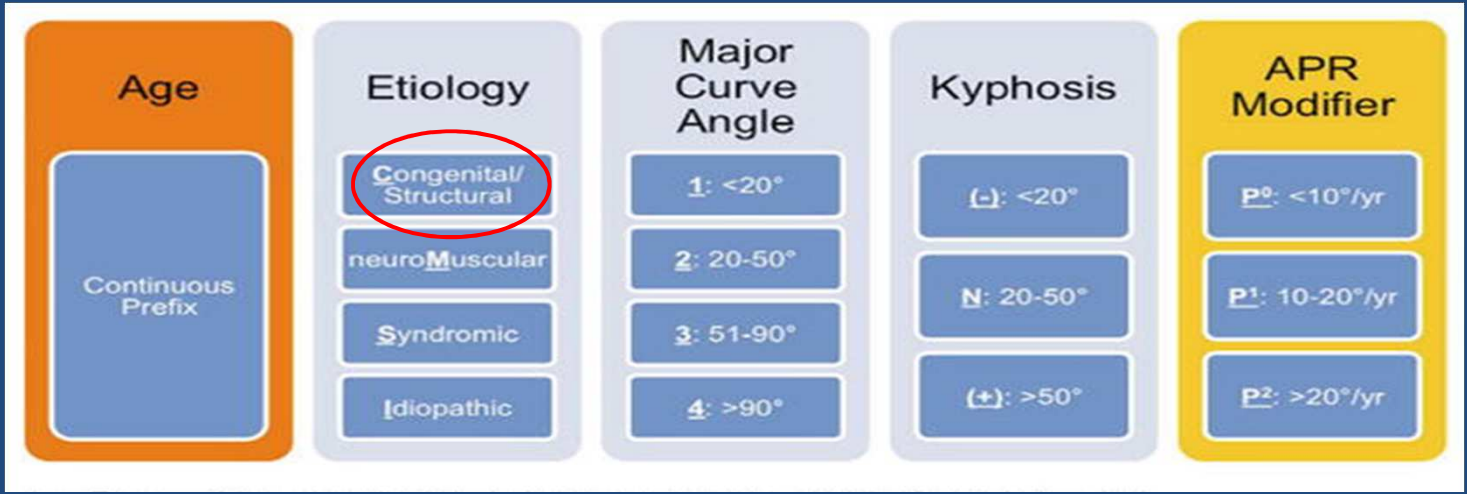

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Treatment of scoliosis

- goal = prevention of curve progresion
- reduction of deformity = brace and surgery
- curves < 20˚ physiotherapy

  20 – 40˚ brace + physiotherapy

  > SURGERY

Surgery posibilities

- Simple hemi-/ fusion
  - convexity hemiepifyseodesis
  - posterior fusion
  - combined a/p fusion
- Fusion with instrumentation
- Instrumentation without fusion
- Osteotomy, hemivertebrectomy, VCR
  - posterior approach
  - combined a/p

¿?

Preop investigation

- spine – X-rays, CT (3D), MRI, EOS
- screening of VACTERL abnormalities
  (Visceral, Anorectal, Cardiac, Tracheo-esophageal fistula, Renal and Lung)

Preop investigation

- spine – X-rays, CT (3D), MRI, EOS
- screening of VACTERL abnormalities
  (Visceral, Anorectal, Cardiac, Tracheo-esophageal fistula, Renal and Lung)
- 3D individual spine model

Patient-specific 3D spine model and screw guides successfully used in scoliosis surgery

November 19, 2019

Al Zahra Hospital, Sharjah, is proud to announce its first scoliosis correction surgery using 3D printing technology

SPINE MODEL FOR SCOLIOSIS TREATMENT

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Spine model for scoliosis treatment

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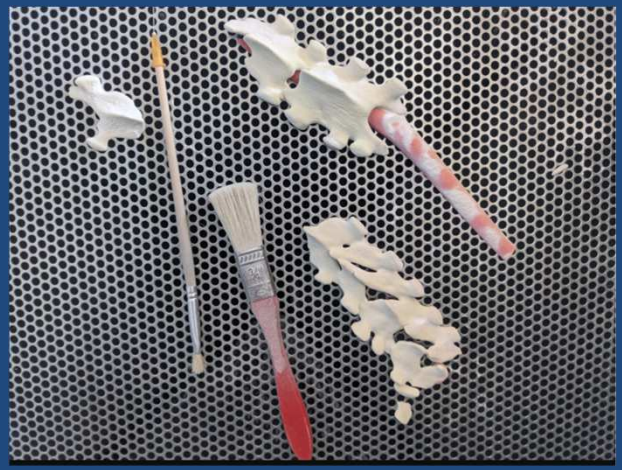

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Surgical Treatment 1977 – 2002 329 Pts

	patients	deformity	correction
• Hemi/epifyzeodesis	102 (31%)	44°	34° (22%)
• PIF	145 (44%)	65°	40° (38%)
• Strut graft + PIF	27 (8%)	66°	39° (40%)
• OT + PIF	33 (10%)	65°	37° (43%)
• HV + PIF	22 (7%)	51°	19° (61%)

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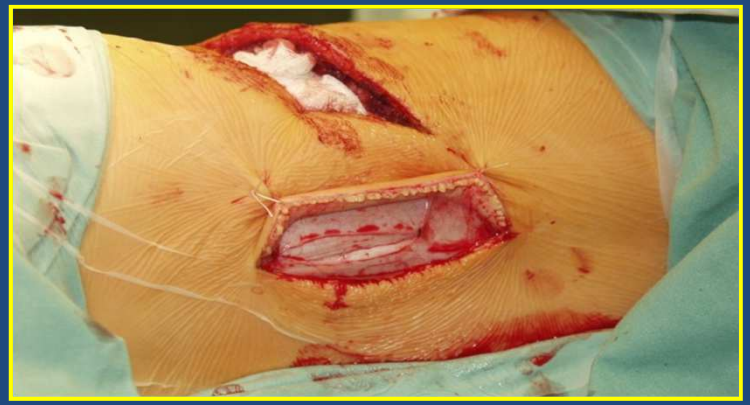
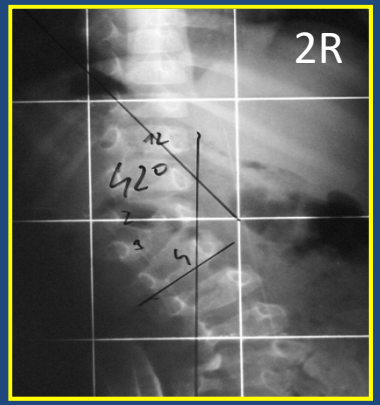
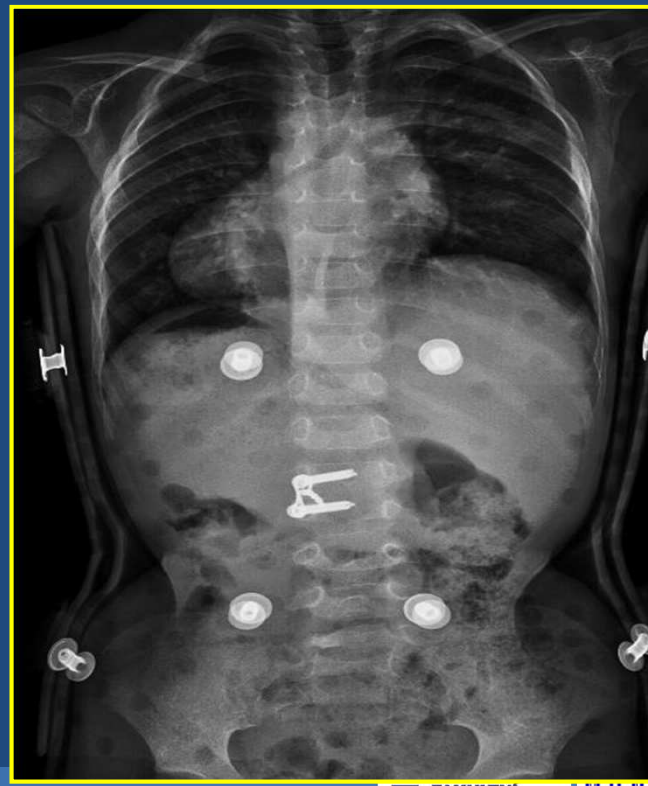
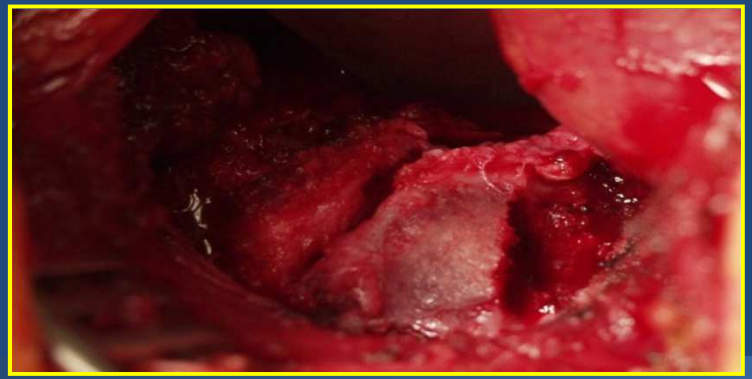
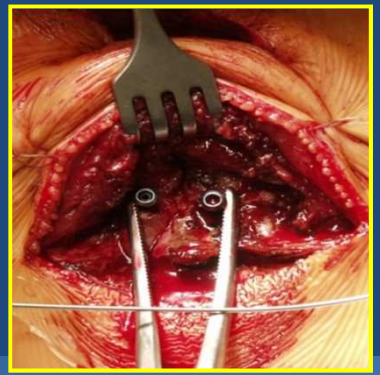
Hemivertebrectomy (combined approach)











Surgical Treatment 2003-2020 144 Pts

- Hemivertebrectomy + 52 Pts (36%)
- Hemivertebrectomy only 27 Pts (19%)

- Single-segment 19 Pts (24%)
- Since 2011 posteror approach only

Surgical Treatment 2003-2020 144 Pts

- Hemivertebrectomy + 52 Pts (36%)
- Hemivertebrectomy only 27 Pts (19%)

(55%)

- Single-segment 19 Pts (24%)
- Since 2011 posteror approach only

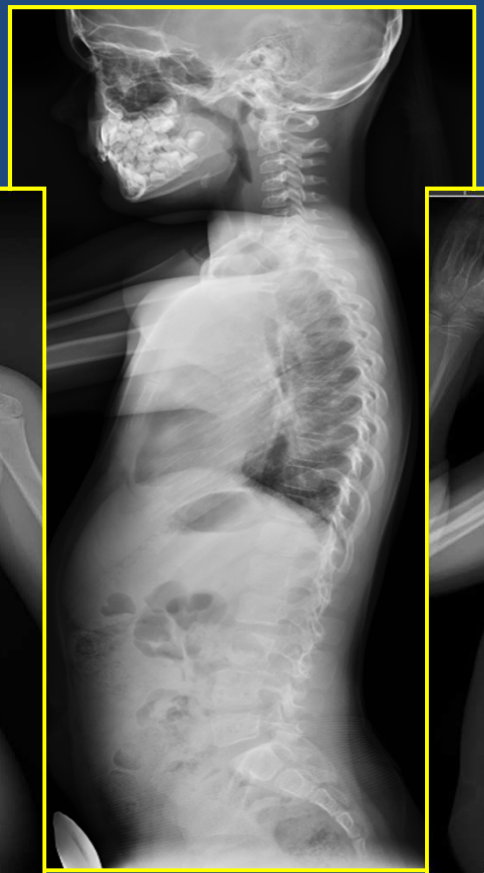
Hemivertebrectomy

- in 1928 Royle - first hemivertebrectomy from the front
- in 1976 Ruf and Harms - hemivertebra resection by a posterior approach
- in 1979 Leatherman - hemivertebectomy as a two stage procedure
- in 1990 Bradford and Boachie-Adje - done in a single stage

- in 2002,3 Ruf and Harms - posterior resection of hemivertebrae with transpedicular instrumentation is very promising procedure, pedicle screws in 1- and 2-year-old children effect on further growth

- in 2011 Wang - comparison of one-stage anteroposterior and posterior- alone hemivertebrae resection combined with posterior correction for hemivertebrae deformity

Posterior only



Unilateral vs bilateral instrumentation ??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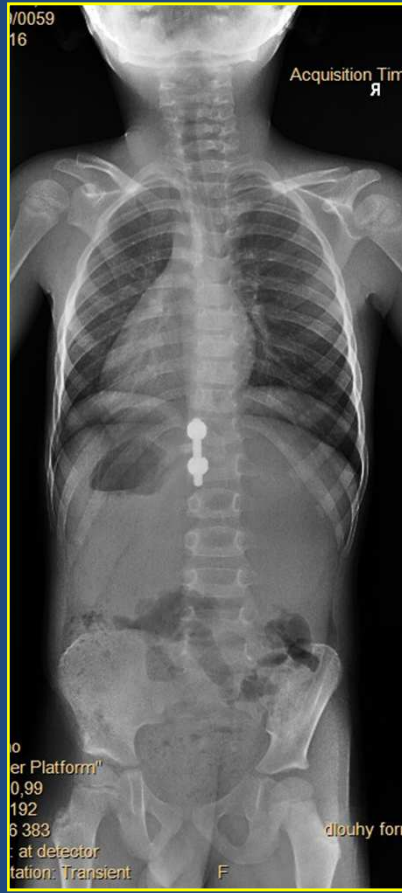
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Posterior-only lumbosacral hemivertebrae resection and fusion in paediatric scoliosis with minimum two year follow-up

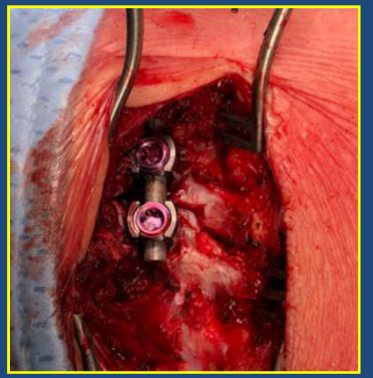
- 16 Pts
- mean age 10.4 ± 3.4 years (3–15 years)
- mean follow-up 38.8 ± 16.2 months (24–79 months)
- mean segmental scoliosis 35.4 ± 9.2 pre-operatively
- and 7.7 ± 5.4 post-operatively (78.4% correction rate)
- and 8.2 ± 5.0 (77%) at the latest follow-up
- no significant difference between bilateral and unilateral instrumentation groups ($P > 0.05$)

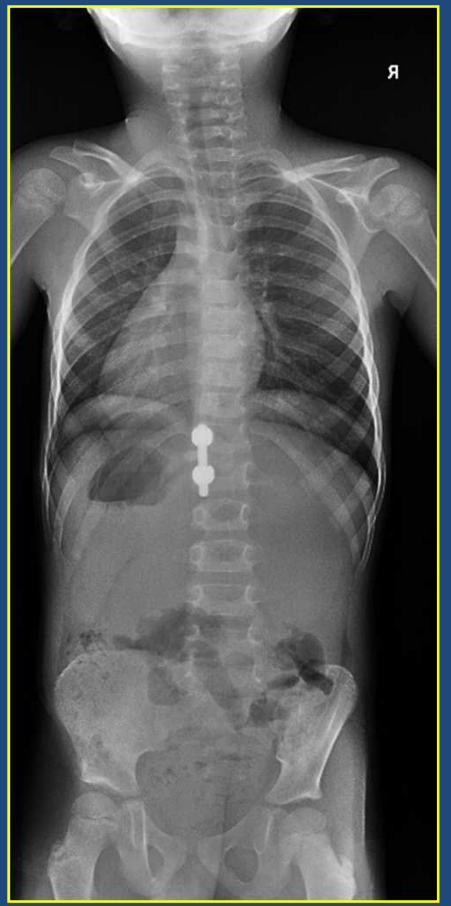
Xuhong Xue & Sheng Zhao & Feng Miao & Kai Li, International Orthopaedics (2020) 44:979–986

19 pts with HE and single-segment fixation

- mean age 7,1 (2,2 - 14,2 years)
- mean follow-up 7,8 (6 - 144 months)
- mean segmental scoliosis 39,6 ± 9,5 pre-operatively
- mean segmental scoliosis 10,1 ± 5,8 post-operatively (74%)

- bilateral instrumentation and fusion – 8 pts
- unilateral instrumentation and fusion – 11 pts



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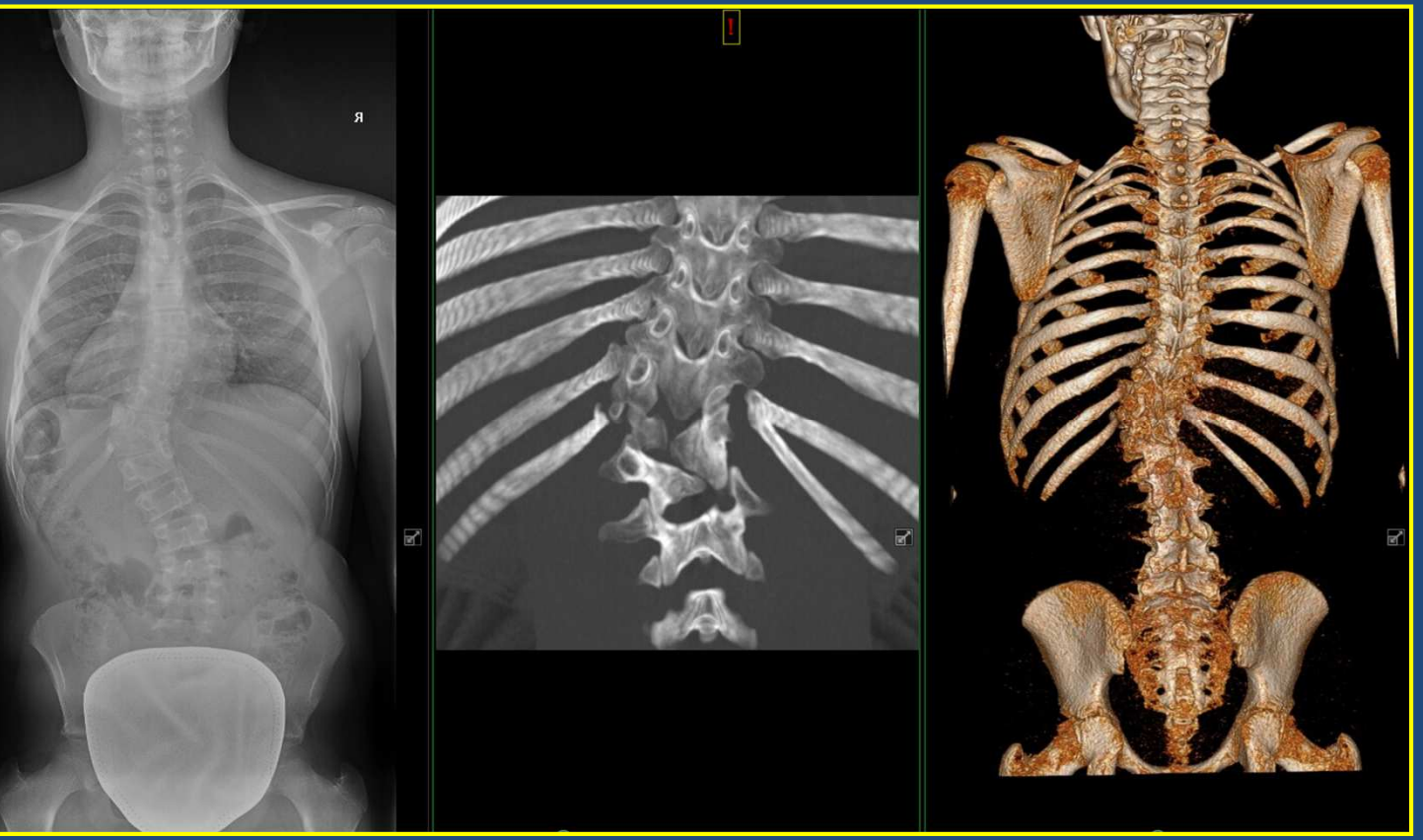

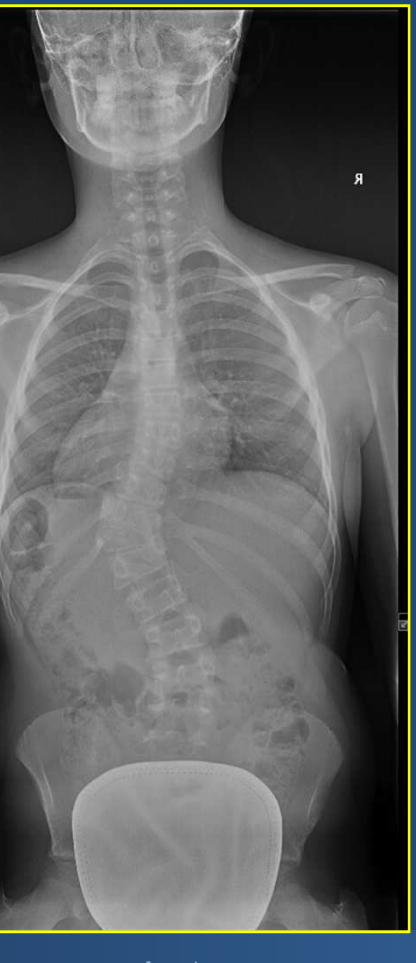


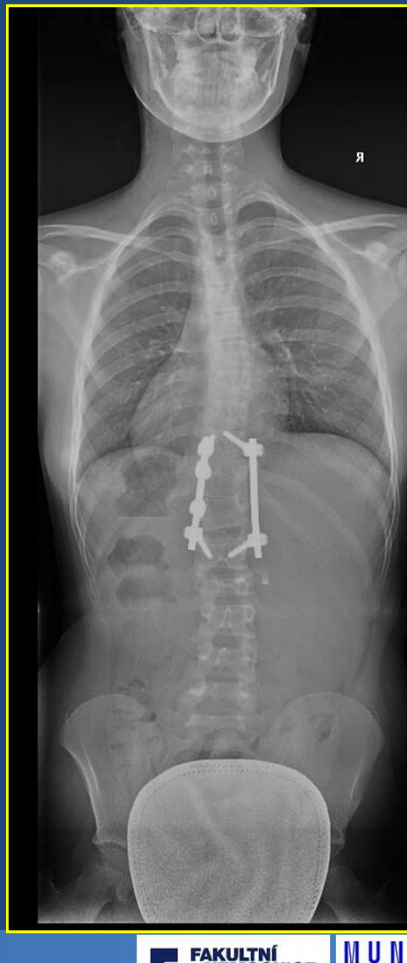


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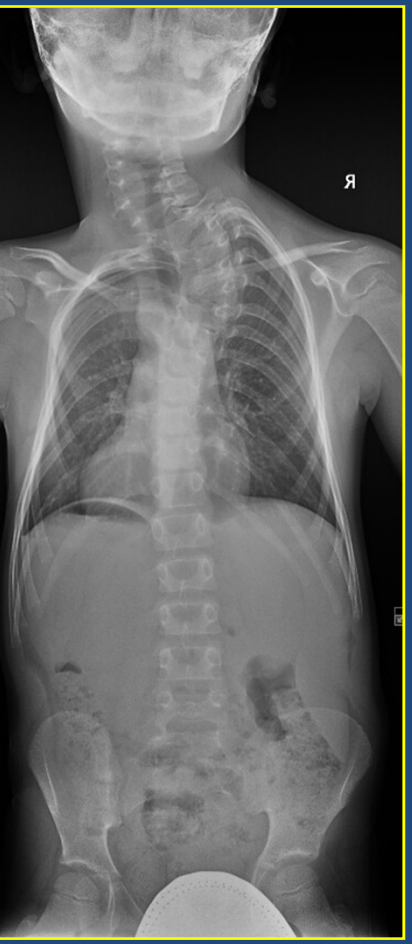


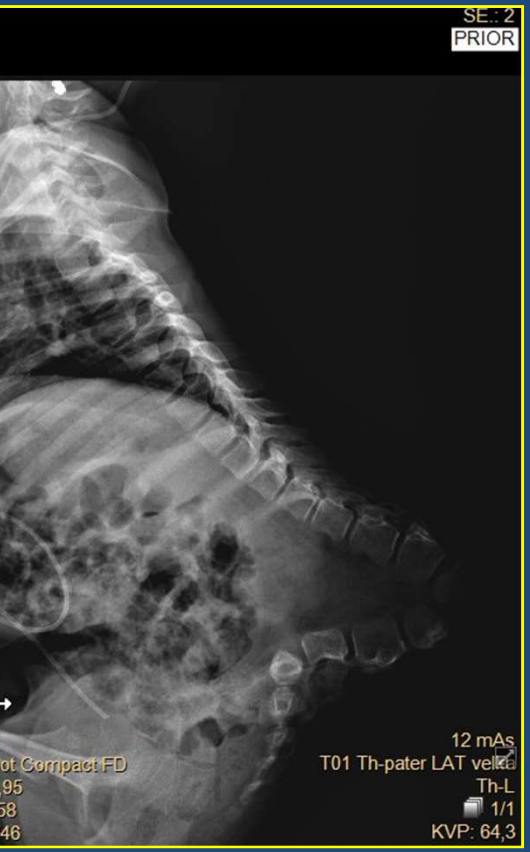
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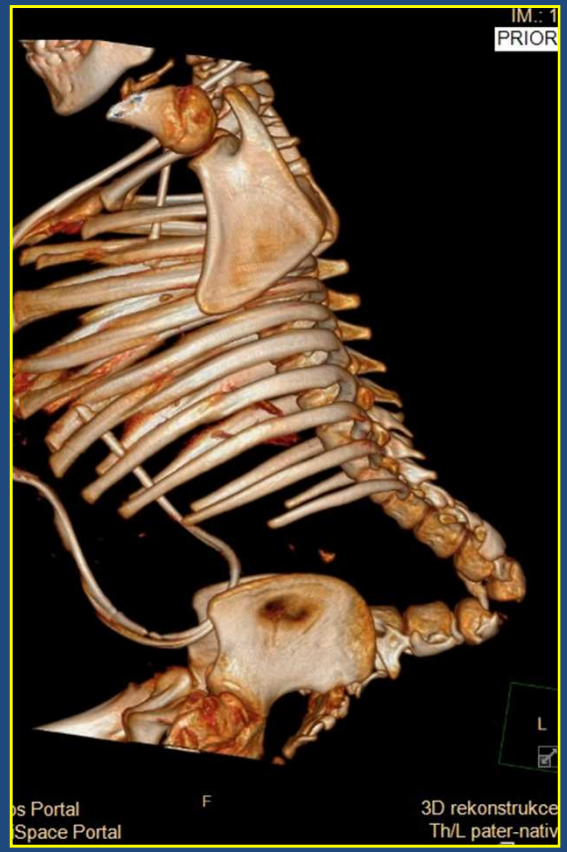
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Solutions Services Case Studies Latest About

Two Hours of Surgery Time Saved - Spina Bifida & Severe Kyphotic Deformity

Main goal of treatment

- prevention of curve progresion
- reduction of spine deformity

- conservative treatment
- surgery