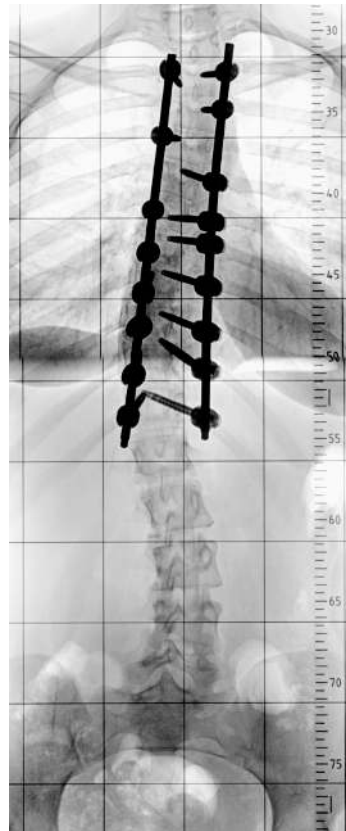


Flexible operative Skoliose-Korrektur – möglich oder nur ein Traum?

Dr. med. Moritz C. Deml
Oberarzt Wirbelsäulenchirurgie
moritz.deml@insel.ch

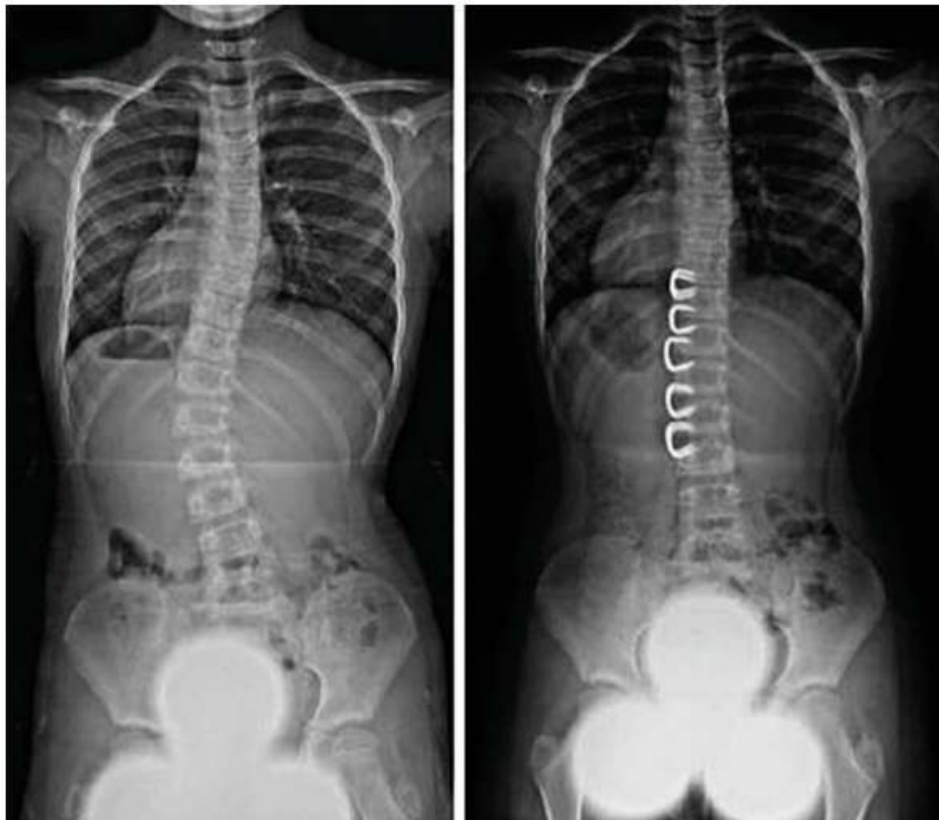
Fusion – dorsal/ventral



- + Etabliertes Verfahren
- + Langzeiterfahrungen
- + Zuverlässige Klinische Ergebnisse
- + Reproduzierbarkeit
- Minimalinvasive Verfahren nur begrenzt möglich
- Verlust der Beweglichkeit



Stapling/Epiphyseodese der Wirbelsäule



Resultate:

Thorakale Kurven $<35^\circ$ - Erfolgsrate: 77.7%

Thorakale Kurven $>35^\circ$ waren nicht erfolgreich

Lumbale Kurven: Erfolgsrate 86.7%

Schlussfolgerung I:

“Some patients with idiopathic scoliosis with moderate curves (25 to 45 degrees) and high risk of progression can be safely treated with VBS as an alternative to bracing.”

Schlussfolgerung II:

“More than half of the patients in our series have undergone or are scheduled to undergo further spinal surgery”

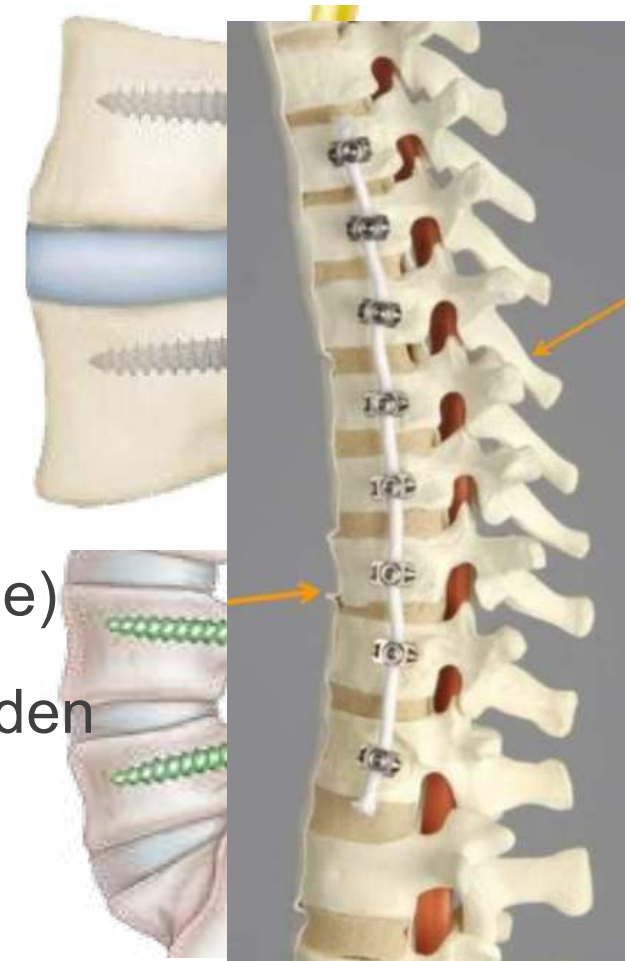
Trobisch P. Skoliosechirurgie/Medizinisch Orthopädische Technik 02/2017

Lavelle WF. J Pediatr Orthop 2011

O'Leary PT. Spine (Phila Pa 1976) 2011

VBT-Vertebral-Body-Tethering

- Titan-Pedikel-Schrauben
- Medizinisches Polyethylene-Terephthalate (PET)
- Tierstudien zeigen, dass durch diese Materialkombination Wirbelkörper-Modulation stattfindet
- Zudem Veränderung in der Bandscheibenzusammensetzung (Kollagen II und Proteoglykane)
- Wirbelkörperwachstumsfuge konnte erhalten werden
- Unbekannte Langzeiteffekte



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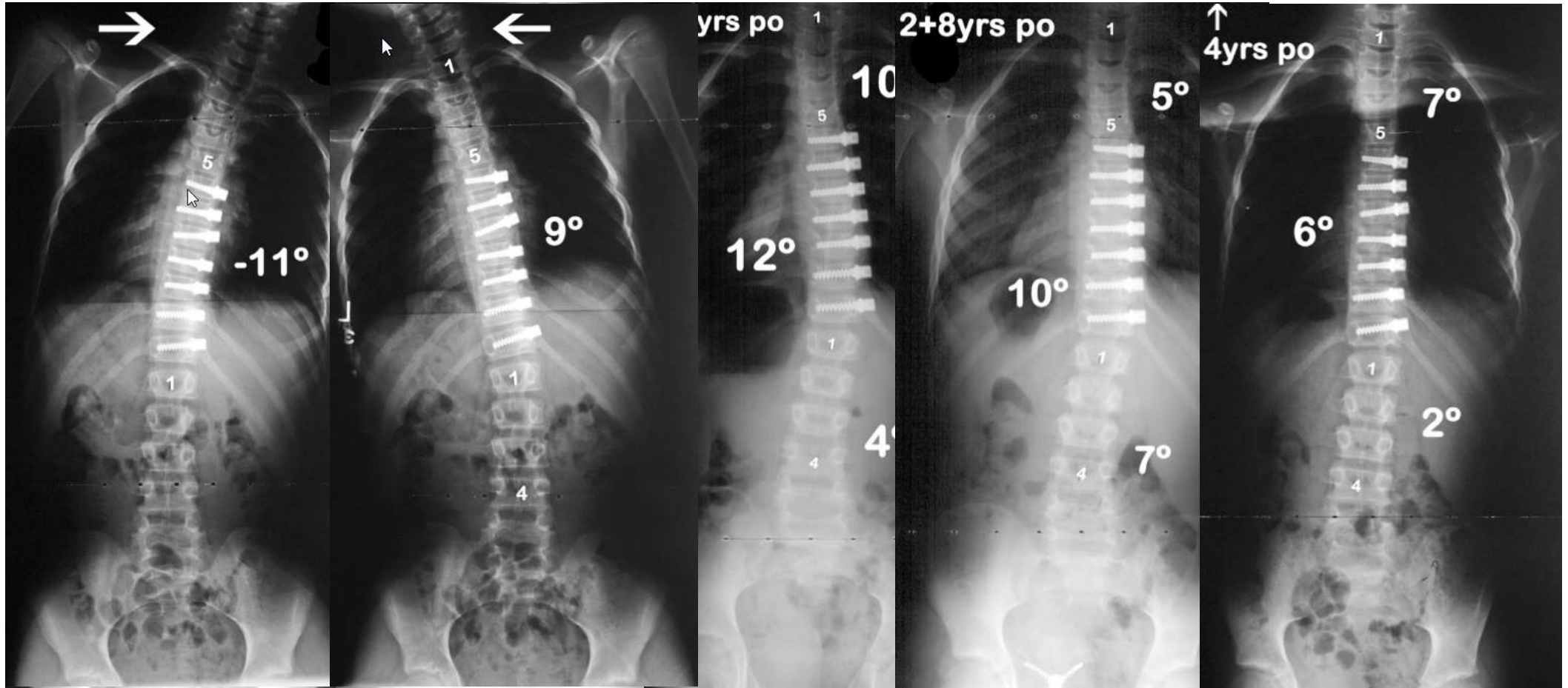
Growth Modulation by Means of Anterior Tethering Resulting in Progressive Correction of Juvenile Idiopathic Scoliosis

A Case Report

By Charles H. Crawford III, MD, and Lawrence G. Lenke, MD

*Investigation performed at the Department of Orthopaedic Surgery,
Washington University School of Medicine, St. Louis, Missouri*

VBT - Erst-Beschreibung

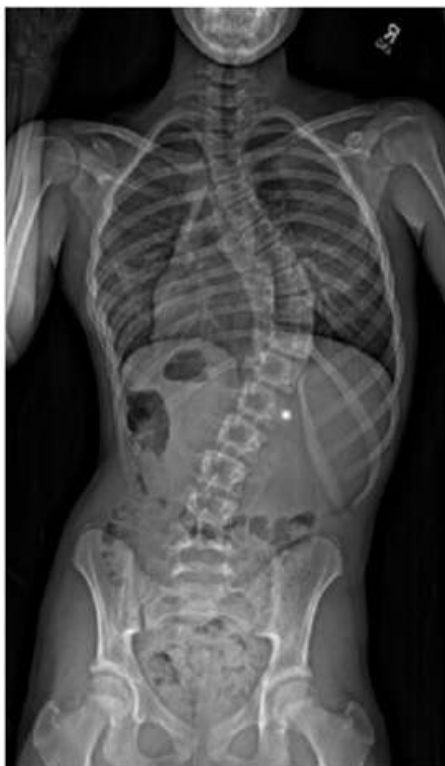


VBT - Klinisches Beispiel I



VBT - Klinisches Beispiel II





Before from back



Before from side



After from back



After from side

[https://services.nhslothian.scot/scottishnationalspinedeformityservice/Spine%20Conditions%20and%20Operations/Pages/Anterior-Vertebral-Body-Tethering-\(AVBT\).aspx](https://services.nhslothian.scot/scottishnationalspinedeformityservice/Spine%20Conditions%20and%20Operations/Pages/Anterior-Vertebral-Body-Tethering-(AVBT).aspx)



[European Spine Journal](#)

July 2015, Volume 24, Issue 7, pp 1533–1539 | [Cite as](#)

Anterior vertebral body tethering for immature adolescent idiopathic scoliosis: one-year results on the first 32 patients

Authors

Authors and

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Spine

DEFORMITY

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Anterior Vertebral Body Tethering for Idiopathic Scoliosis

Two-Year Results

Amer F. Samdani, MD,* Robert J. Ames, BA,*† Jeff S. Kimball, BS,*† Joshua M. Pahys, MD,* Harsh Grewal, MD,*‡ Glenn J. Pelletier, MD,*§ and Randal R. Betz, MD¶

Study Design. Retrospective review.

Objective. To report the 2-year results of the initial cohort undergoing anterior vertebral body tethering (VBT).

improvement at 2 years (Cobb angle = $13.5 \pm 11.6^\circ$, % correction = 70%; $P < 0.00002$). Similarly, the preoperative lumbar curve of $25.1 \pm 8.7^\circ$ demonstrated progressive correction (first erect = $14.9 \pm 10.8^\circ$, second erect = $7.2 \pm 5.18^\circ$, third erect = 7.6° , $P < 0.00002$).

VBT – Studien II

- 2 Jahre Follow – up
- 11 Patienten
- Risser 3.4 (+/- 1.1)
- Im Schnitt 7.8 Wirbel operiert

- Cobb – Winkel vor Operation – 44.2 (+/- 9.0°)
- Erste Korrektur 20.3° (+/- 11.0°)
- 2 Jahre nach Op: 13.5° +/-11.6°
- Lumbale Kurve: 25.1 (+/-8.7°) → 7.2 (+/-5.1°)

- Keine «Major» Komplikationen
- 2 Patienten wurden zum Lösen des Bandes revidiert (Überkorrektur)

Spine

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Anterior Vertebral Body Tethering for Idiopathic Scoliosis

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Improvement at 2 years (Cobb angle = 13.5 ± 11.6°, % correction = 70%; P < 0.00002). Similarly, the preoperative lumbar curve of 25.1 ± 8.7° demonstrated progressive correction (first erect = 14.9

Ideale Kandidaten für VBT

- Idiopathische Skoliose
- >10 Jahre – weiteres Wachstum erwartet
- Risserstadium 0-3
- 50% Flexibilität der Kurve in Bewegungsaufnahmen
- Thorakale oder lumbale Kurve von 30-60°

VBT – Limitationen / Chancen

- Noch immer neue Technik
- Keine Langzeitergebnisse
- Gefahr der Überkorrektur
- Geringe Sicherheit bezüglich idealer Operationsindikation
- Bisher off-label Gebrauch der Implantate
- Übernahme der Kosten nicht klar
- Schnellere Rückkehr zu «normalen» Lebensaktivitäten
- Langzeit-Erhalt Restbeweglichkeit wahrscheinlich
 - Ausmass nicht bekannt

Merci...



”Preservation of spinal motion, particularly in the lumbar spine, is a highly attractive goal.”

<https://www.srs.org/about-srs/quality-and-safety/informational-statements/vertebral-body-tethering-vbt-in-pediatric-and-adult-spinal-deformity>

References:

Website: www.zimmerbiomet.com/medical-professionals/spine/product/dynesys-dynamic-stabilization-system.html

Newton PO, Fricka KB, Lee SS et al. Asymmetrical flexible tethering of spine growth in an immature bovine model. Spine 2002;27(7):689-93.

Braun JT, Ogilvie KW, Akyuz E et al. Fusionless scoliosis correction using a shape memory alloy staple in the anterior thoracic spine of the immature goat. Spine 2004;29(18):1980-9

Newton PO, Farnsworth CL, Faro FD et al. Spinal growth modulation with an anterolateral flexible tether in an immature bovine model: disc health and motion preservation. Spine 2008;33(7):724-33

Chay E, Patel A, Ungar B, et al. Impact of unilateral corrective tethering on the histology of the growth plate in an established porcine model for thoracic scoliosis. Spine 2012;37(15):E883-9

Crawford CH 3rd, Lenke LG. Growth modulation by means of anterior tethering resulting in progressive correction of juvenile idiopathic scoliosis: a case report. J Bone and Joint Surg (Am)2010;92(1):202-9.

Samdani AF, Ames RJ, Kimball JS et al. Anterior vertebral body tethering for immature adolescent idiopathic scoliosis: one year results on the first 32 patients. Eur Spin J 2015;24:1533-9.

The Role of Remodeling and Asymmetrical Growth in Vertebral Wedging, David D. Aronsson, Ian Stokes, Carole McBride, University of Vermont College of Medicine, Burlington, Vermont, "Research into Spinal Deformities 7", C.-E.Aubin et al (Eds), IOS Press 2010.