

# Lordoplasty for osteoporotic vertebral fracture using a specially designed jig

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# Disclosure of Conflict of Interest

- No funds were received in support of this work.
- No benefits in any form have been or will be received from a commercial party related directly or indirectly to the subject of study.

# Introduction

- **Vertebroplasty** can relieve back pain effectively and improve quality of life in those who failed the conservative management
  - **However, vertebroplasty cannot correct the spinal deformity**
- **Kyphoplasty** can restore the vertebral height and correct the kyphotic deformity
  - **However, it is more expensive**
  - **Loss of correction after deflating the balloon**
  - **Cannot prevent adjacent level collapse**

# Adjacent level collapse

- 17.8% of patient within 1 year
- 16% at adjacent level
- Majority within 2 months

Berlemann U, Ferguson SJ, Nolte L-P, Heini PF. *JBJS Br* 2002;84:748–752  
B Carmen et al. *Eur Spine J* 2006;15: 1050–1067



# Lordoplasty (Orler R et al 2006)

Eur Spine J (2006) 15:1769–1775  
DOI 10.1007/s00586-006-0108-x

ORIGINAL ARTICLE

## Lordoplasty: report on early results with a new technique for the treatment of vertebral compression fractures to restore the lordosis

Rene Orler | Lars H. Frauchiger | Uta Lange |  
Paul F. Heini

- 26 patients, Age 56-85, FU 15 months
- Pain relief of 87% (VAS 7.3 to 1.9)
- Significant restoration of **anterior vertebral height** (11.0 +/- 5.7mm) and **mid vertebral height** (8.8 +/- 5.6mm)  $p < 0.001$
- Significant correction in **Vertebral kyphotic angle** and **Segmental kyphotic angle**: 15.2 deg and 10.0 deg  $p < 0.001$

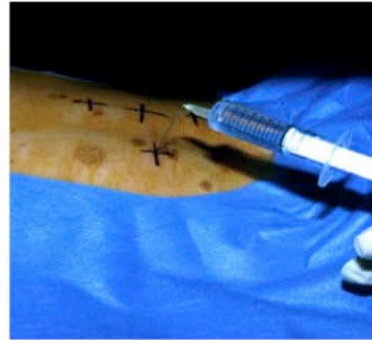


Fig. 1 Application of local anesthesia

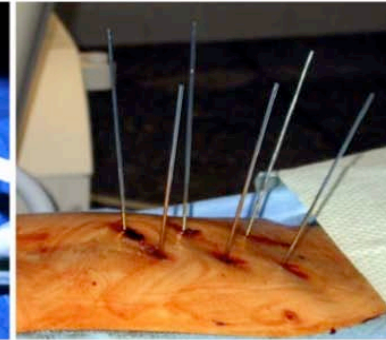


Fig. 2-3 Bipedicular placement of K-wires with C arm in ap view via stab incision

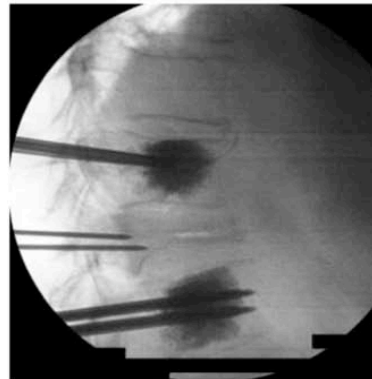
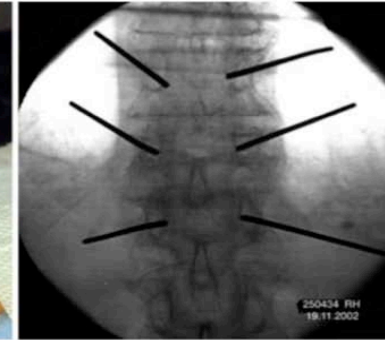


Fig. 4 Vertebroplasty of adjacent vertebrae, trochars slightly advanced

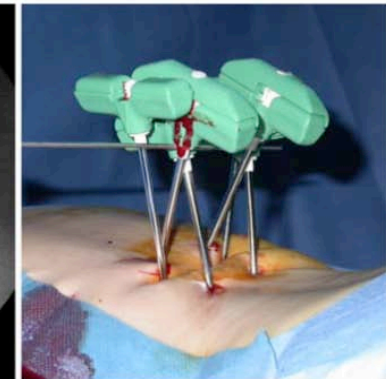


Fig. 5 Cannulas transconnected with a lordotic moment

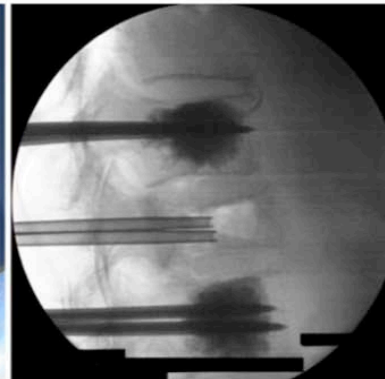
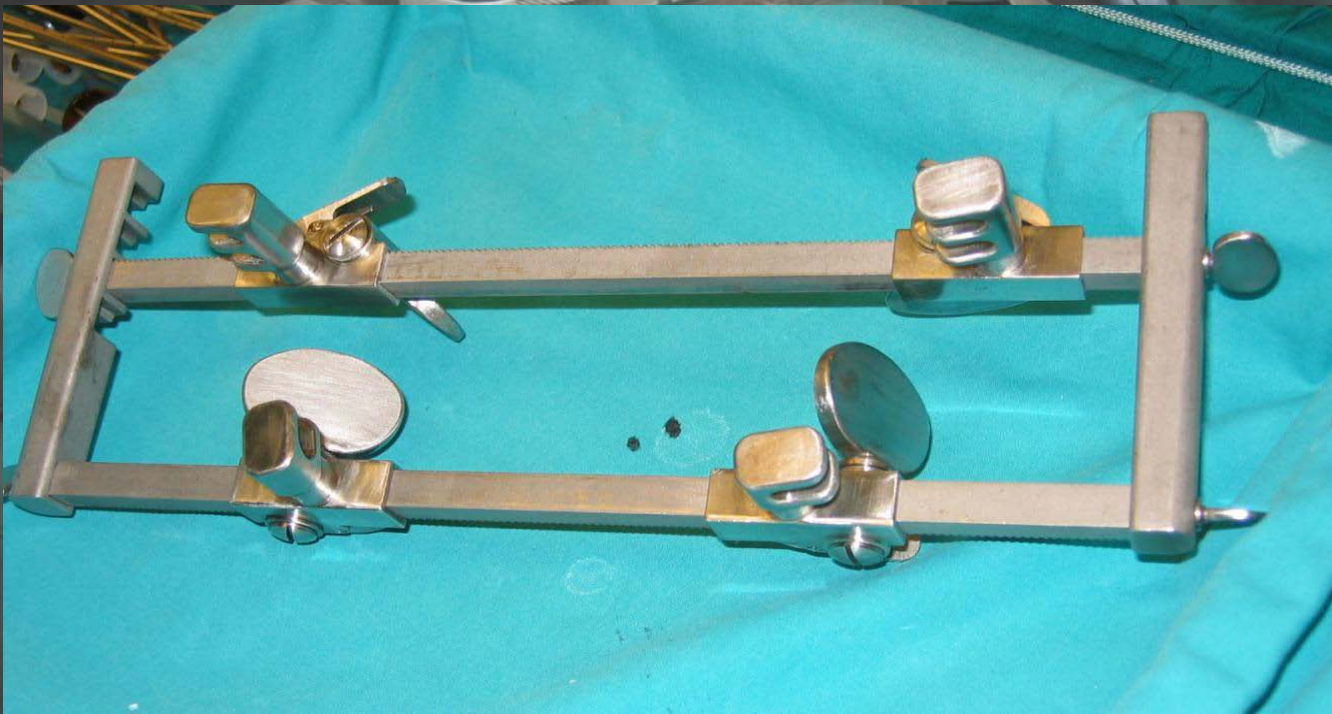


Fig. 6 Lordotic moment applied on the fractured vertebra

# UCH Lordoplasty Jig

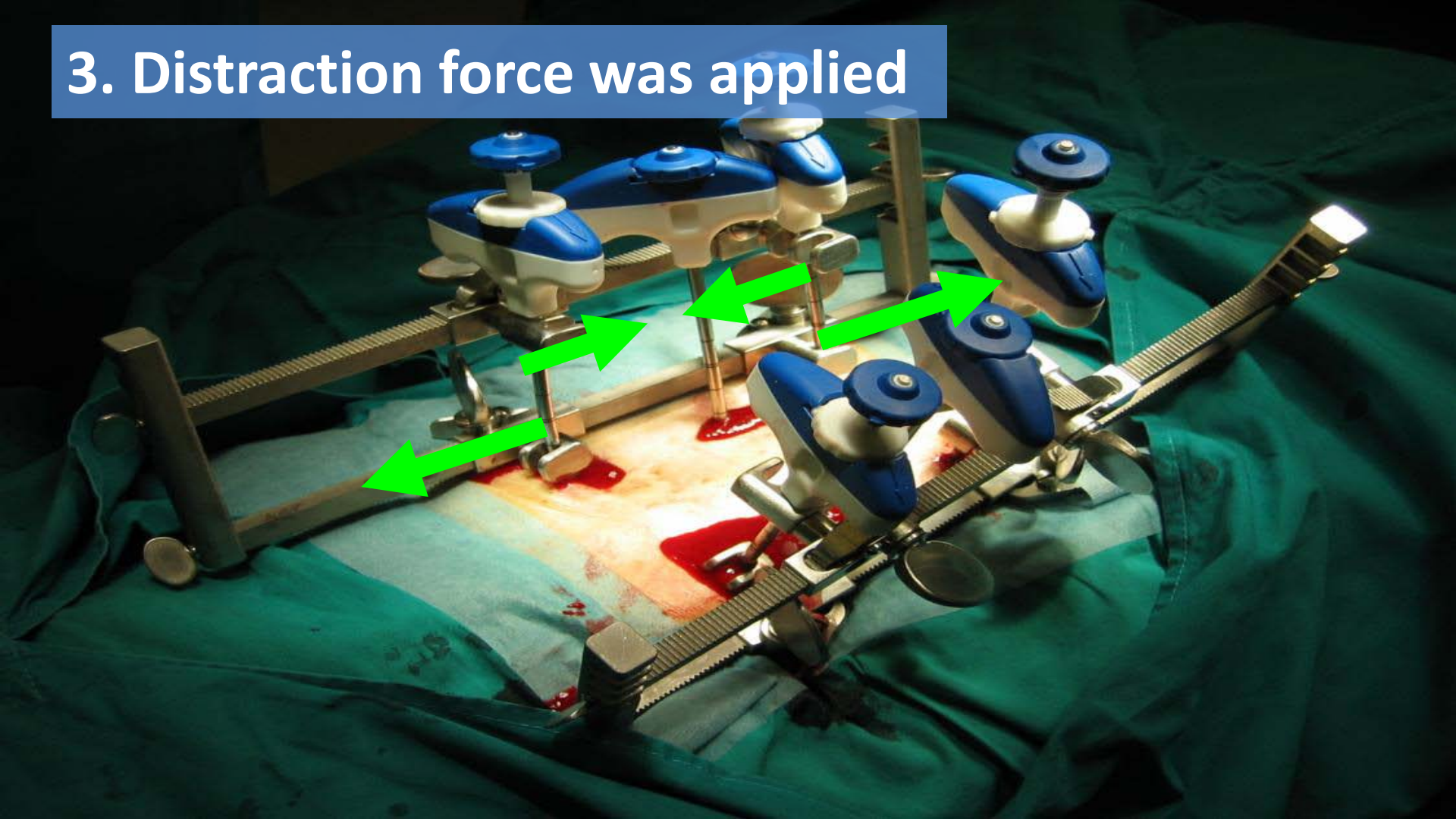


1. Cement was injected percutaneously into the upper and lower adjacent vertebrae



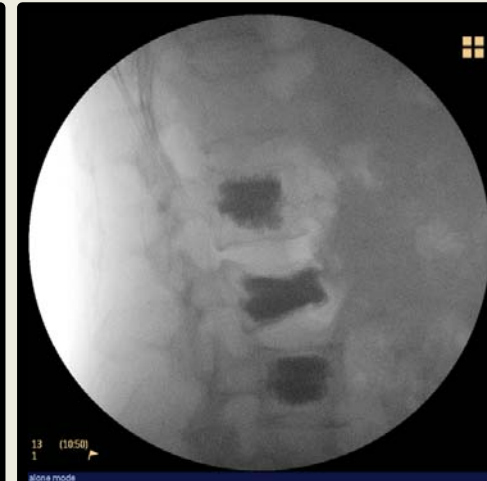
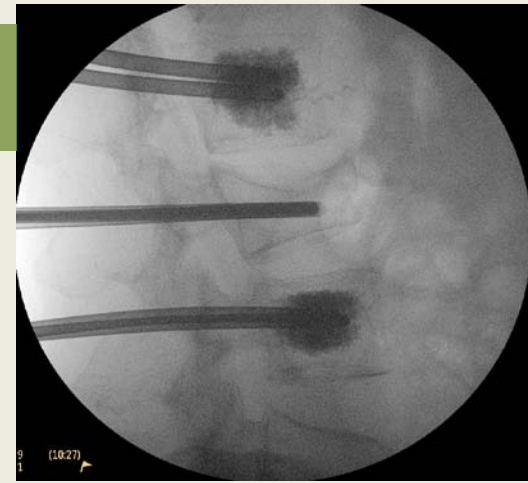
2. The trochar and cannula were not removed after injection, but were connected to a special jig which allowed us to perform distraction and compression gradually

### 3. Distraction force was applied





## 4. Cement was injected into the fracture vertebra



# Our study

- Prospective study
- **9 patients** with single osteoporotic vertebral collapse and persistent pain after failure of conservative management
- Exclusions – Other causes of vertebral collapse, multiple collapses, multiple comorbidities, not able to have prone position for the procedure
- Age 53 to 88 (mean 70)
- Mean FU 1 year
- Average **VAS** score improved from 7.8 to 1.5
- Mean improvement in **segmental kyphosis angle** was 7 degrees
- Mean **vertebral height restoration** was 66.8%
- **There was no serious complication perioperatively**



	F/56	F/53	F/84	F/76	F/77	F/56	F/79	F/58	F/88
Time from fracture to surgery (months)	3	6	2	10	6	4	2	7	5
Pre-op Pain VAS	8	5	8	10	6	6	10	7	10
<b>FU Pain VAS</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>
Pre-op ODI	48%	64%	84%	84%	71%	53%	67%	84%	89%
<b>FU ODI</b>	<b>8%</b>	<b>8%</b>	<b>18%</b>	<b>26%</b>	<b>27%</b>	<b>28%</b>	<b>22%</b>	<b>44%</b>	<b>18%</b>
Segmental kyphosis change	10	6	4	8	3	8	8	5	11
Middle vertebral height restoration (%)	98	78	52	86	71	71	63	77	58

# Discussion

- Our result of lordoplasty is encouraging
- **Pain relief** is significant, with VAS improved from 7.8 to 1.5
- **Deformity correction** was less significant when compared to Orler's series
  - May be related to late presentation and longer time from fracture to surgery
  - Time from fracture surgery
    - Orler R et al. – 48 days on average
    - Our study – 5 months on average
- **The result of lordoplasty with our specially designed jig was safe, effective and encouraging**
  - Good pain relief and restoration of vertebral height
  - Restore lordosis and prevent kyphotic deformity. Deformity correction may be more effective if the procedure is performed earlier
  - Avoid adjacent level collapse
  - No major perioperative complication
  - Less expensive than kyphoplasty

