

實證醫學 病例討論報告  
Evidence-Based Medicine  
-骨科 Orthopedics

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# Today's outline

- Clinical scenario-臨床場景
- Asking-提出問題
- Acquire- 搜尋資料
- Appraisal-嚴格評讀
- Apply-臨床應用
- Audit-自我評估

# Clinical scenario-臨床場景

## 1. Patient profile

病人基本資料及主訴

## 2. Assessment

評估（包含症狀、理學檢查、實驗室檢查、  
影像學檢查）

## 3. Treatment

治療方式及對治療的反應

## 4. Plan

後續治療計畫



## Patient Profile (1)-General data

- Name:陳 X 惠
- Gender: female
- Age: 81 years old
- Admission date: 99/03/10
- Chart number: 08620280



## Patient Profile (1)-Chief complaint

- Progressive bilateral lower limbs weakness for 2~3 months

## Present illness(1)

- This 81 year-old female patient has the underline diseases of:

**Hypertension**

**Diabetes mellitus**

- She suffered from progressive **bilateral lower limbs weakness** for 2~3 months
- **back pain** for months with bilateral lower limb weakness. (R=L) She **denied** of: bilateral lower limb numbness/pain; radiation pain; aggravating factor/relieving factor.

## Present illness(2)

- **Knocking pain** at T-L joint was noted.
- She **denied** any trauma history
- Steroid (黒薬丸) use (+)
- She came to our OPD for help and radiography showed **T11 vertebrae compression fracture.**
- She was the admitted for further evaluation and management.

# Past history (1)

## Systemic disease:

- **Hypertension(+)** with regular medication control
- **Diabetes Mellitus(+)** under medication control
- HBV(-)
- HCV(-)

## Surgical history:

- **MK92/MK95: received twice vertebroplasty due to T7 and T10 compression fracture**

# Physical examination

Consciousness: clear

Vital sign:

BP: 140/ 97mmHg, PR: 60bpm, RR: 20cpm, BT: 36.8 °C

HEENT: no trauma, no redness, no running nose

- Neck: supple, no palpable mass  
no enlarged jugular vein

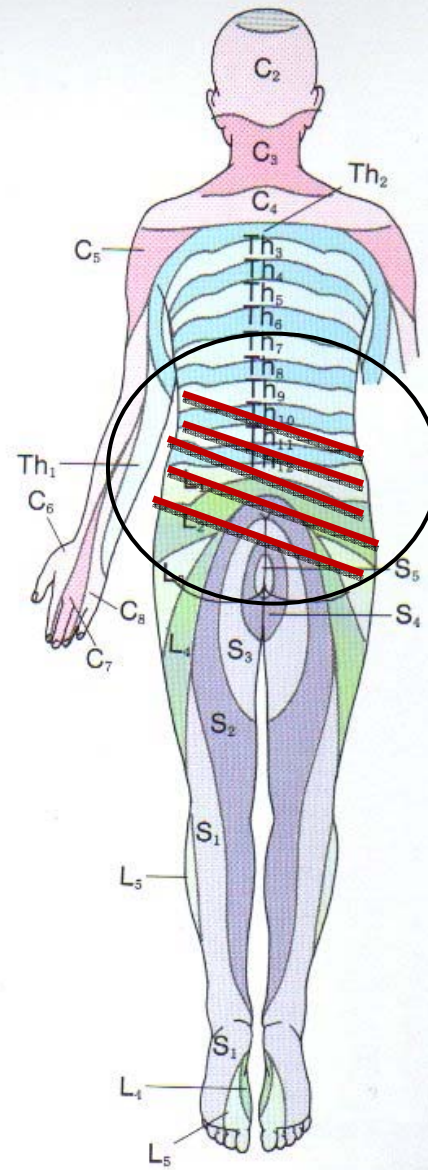
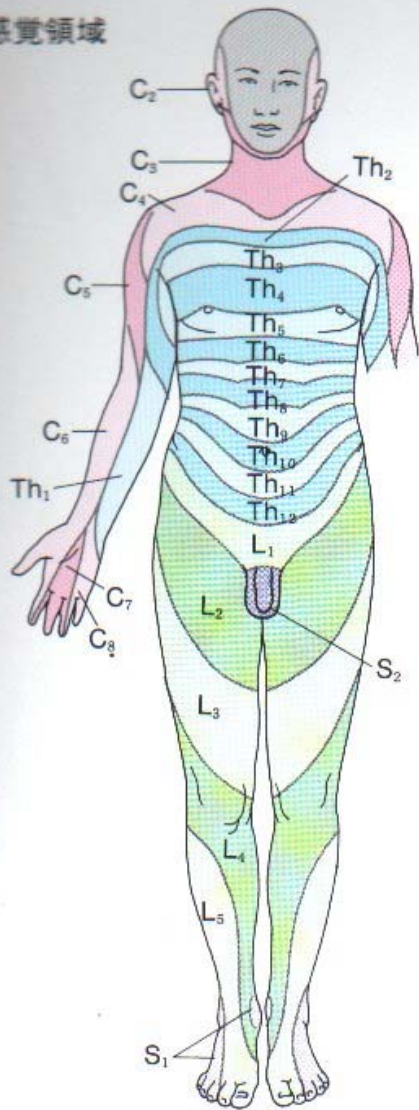
Chest: heart sound: regular heart beat, no murmur  
breath sound: clear, no rales, no crackle

Abdomen: soft, flat, no tenderness, normative bowel sound

Extremities: freely movable, no gross deformity,  
distal pulsation and sensation: ok

	R	L
Muscle power: upper	5	5
lower	4	4

感覺領域

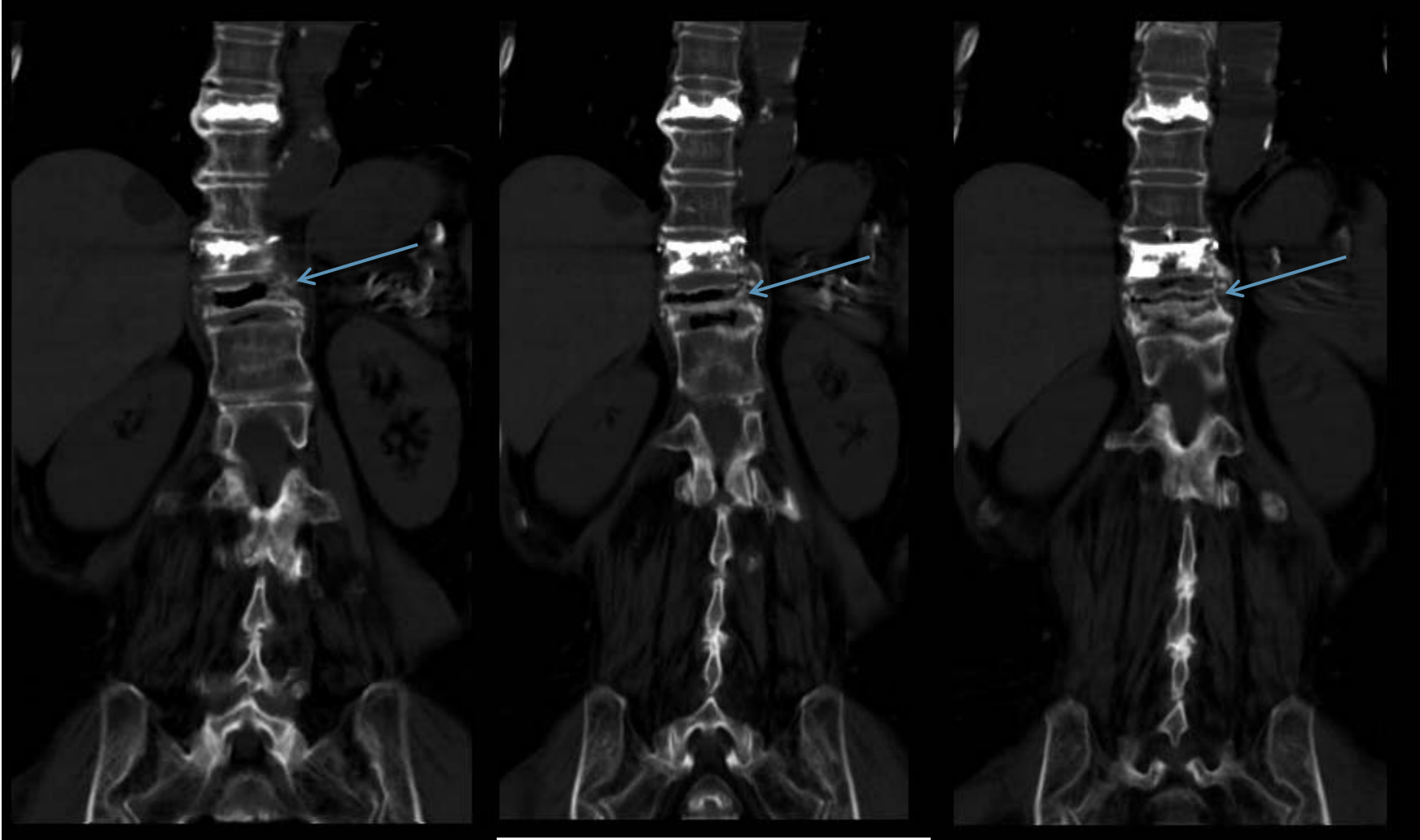


# Laboratory data

- |               |      |        |        |         |        |        |       |
|---------------|------|--------|--------|---------|--------|--------|-------|
| 項目:           | 收到檢體 | PT p   | PT c   | PT(INR) | PTT P  | PTT C  | GLU   |
| 日期(時間)        |      | second | second |         | second | second | mg/dL |
| 980210 (1339) |      | 9.4    | 10.7   | 0.90    | 28.8   | 27.8   | 249   |
- |               |      |      |      |       |       |         |         |
|---------------|------|------|------|-------|-------|---------|---------|
| 項目:           | AST  | ALT  | CRP  | BUN   | CREA  | NA      | K       |
| 日期(時間)        | IU/L | IU/L | mg/L | mg/dL | mg/dL | m mol/L | m mol/L |
| 980210 (1339) | 30   | 20   | 0.38 | 19.5  | 0.69  | 138     | 4.7     |
- |               |         |
|---------------|---------|
| 項目:           | CL      |
| 日期(時間)        | m mol/L |
| 980210 (1339) | 104     |
- |               |      |          |                      |      |      |      |      |
|---------------|------|----------|----------------------|------|------|------|------|
| 項目:           | 收到檢體 | WBC      | RBC                  | HGB  | HCT  | MCV  | MCH  |
| 日期(時間)        |      | x1000/uL | x10 <sup>6</sup> /uL | g/dL | %    | fl   | Pg   |
| 980210 (1318) |      | 8.4      | 4.62                 | 12.1 | 43.3 | 93.8 | 32.6 |
- |               |      |          |      |      |       |      |       |
|---------------|------|----------|------|------|-------|------|-------|
| 項目:           | MCHC | PLT      | RDW  | NEUT | EOSIN | BASO | LYMPH |
| 日期(時間)        | %    | x1000/uL | %    | %    | %     | %    | %     |
| 980210 (1318) | 34.8 | 258      | 13.0 | 61.3 | 4.5   | 0.1  | 27.6  |
- |               |      |       |
|---------------|------|-------|
| 項目:           | MONO | E.S.R |
| 日期(時間)        | %    | /mm   |
| 980210 (1318) | 6.5  | 12    |

# X-ray: L+T spine AP, Flexion/Extension view





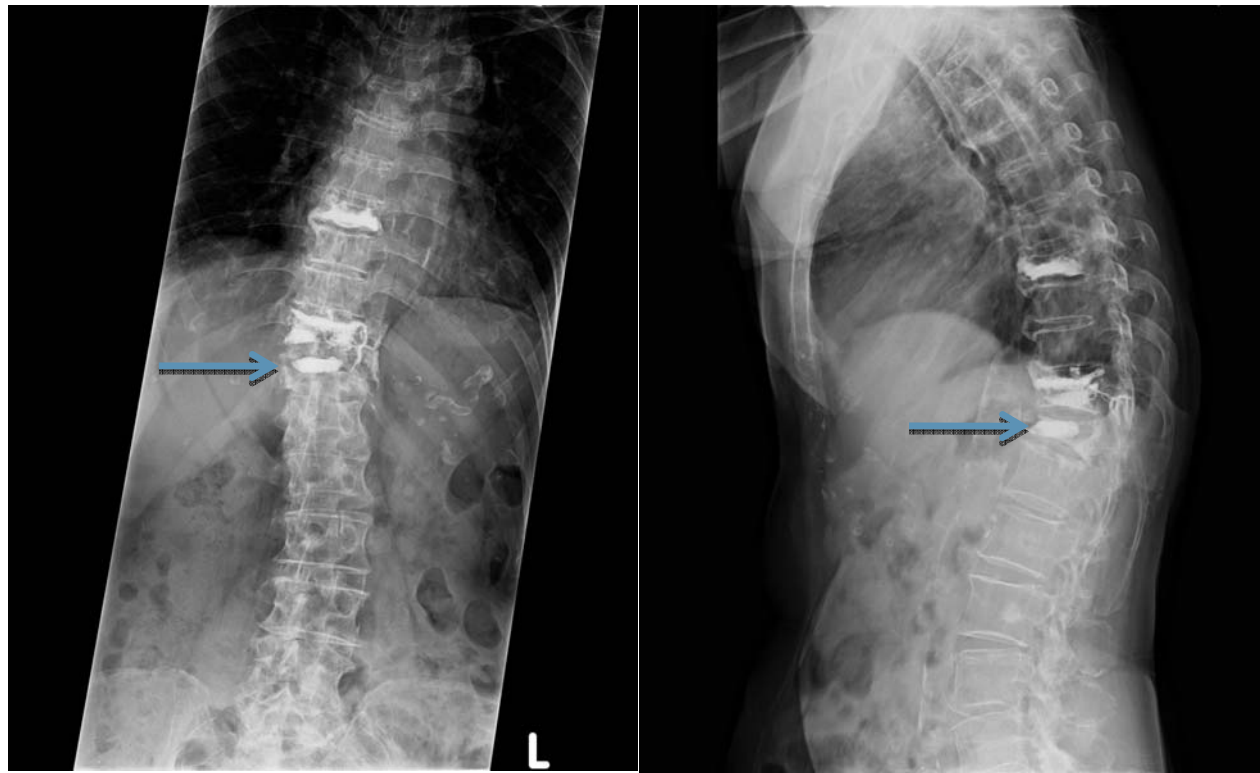


## Assessment (4)-tentative diagnosis

- T11 vertebra compression fracture, suspect osteoporosis related

# Treatment Plan

We performed T11 vertebroplasty



# Asking-提出臨床問題

## 1. Background question

- (1) question
- (2) answer
- (3) apply

## 2. Foreground question

- (1) PICOT
- (2) search data
  - a. Summary
  - b. Synopses
  - c. Synthesis
  - d. Study



# Background questions

- Question 1:  
How does compression fracture occur?
- Question 2:  
How to manage compression fracture?

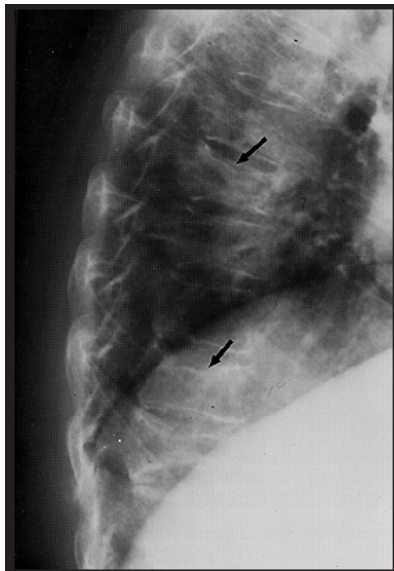


# Vertebra compression fracture etiology

- Trauma related
- Osteoporotic bone
- Infection
- Steroid/NSAID use

## Radiographic features of **spinal osteoporosis** :

- **wedging of the vertebra anteriorly with vertebral collapse**
- **vertebral end-plate irregularity**
- **general demineralization**



Types of **osteoporotic** vertebral fracture



Normal

Biconcave (codfishing) deformity

Wedge fracture

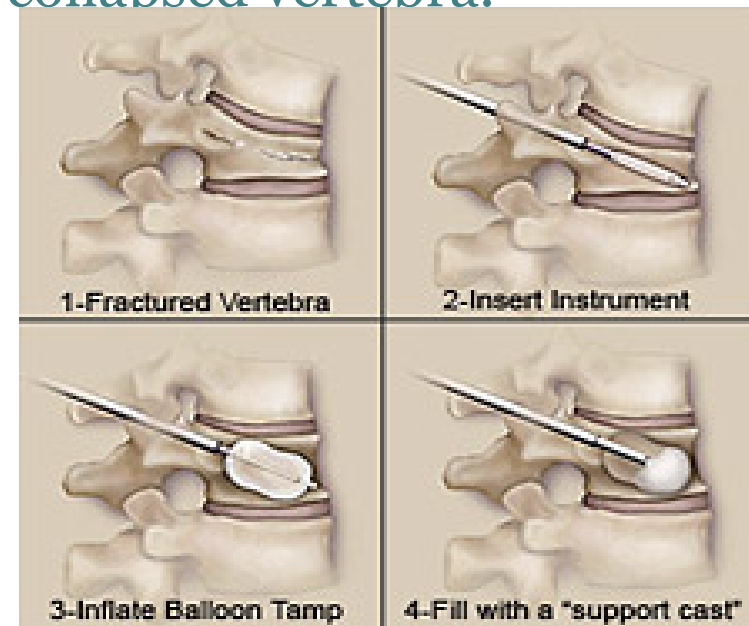
Compression fracture

# MANAGEMENT

- Conservative treatment: bed rest + pain control
- Provide relief from pain
- Vertebroplasty and balloon kyphoplasty
  - **Vertebroplasty**: the percutaneous injection of bone cement under fluoroscopic guidance into a collapsed vertebra.
  - **Balloon kyphoplasty**

## Features:

- Relieve pain
- Stabilize fracture
- Restore vertebral height
- Reduce spinal deformity





# Apply to the Patient

- **Osteoporotic** bone
- Denied trauma history
- No infection signs
- **Steroid**/NSAID use

We performed vertebroplasty for our patient.



# Foreground question

- Does vertebroplasty elicit better symptom relief and quality of life than ballon kyphoplasty?

# EBM

P: vertebral compression fracture

I: vertebroplasty

C: balloon kyphoplasty

O: symptom relief, quality of life



**The Cochrane Library**

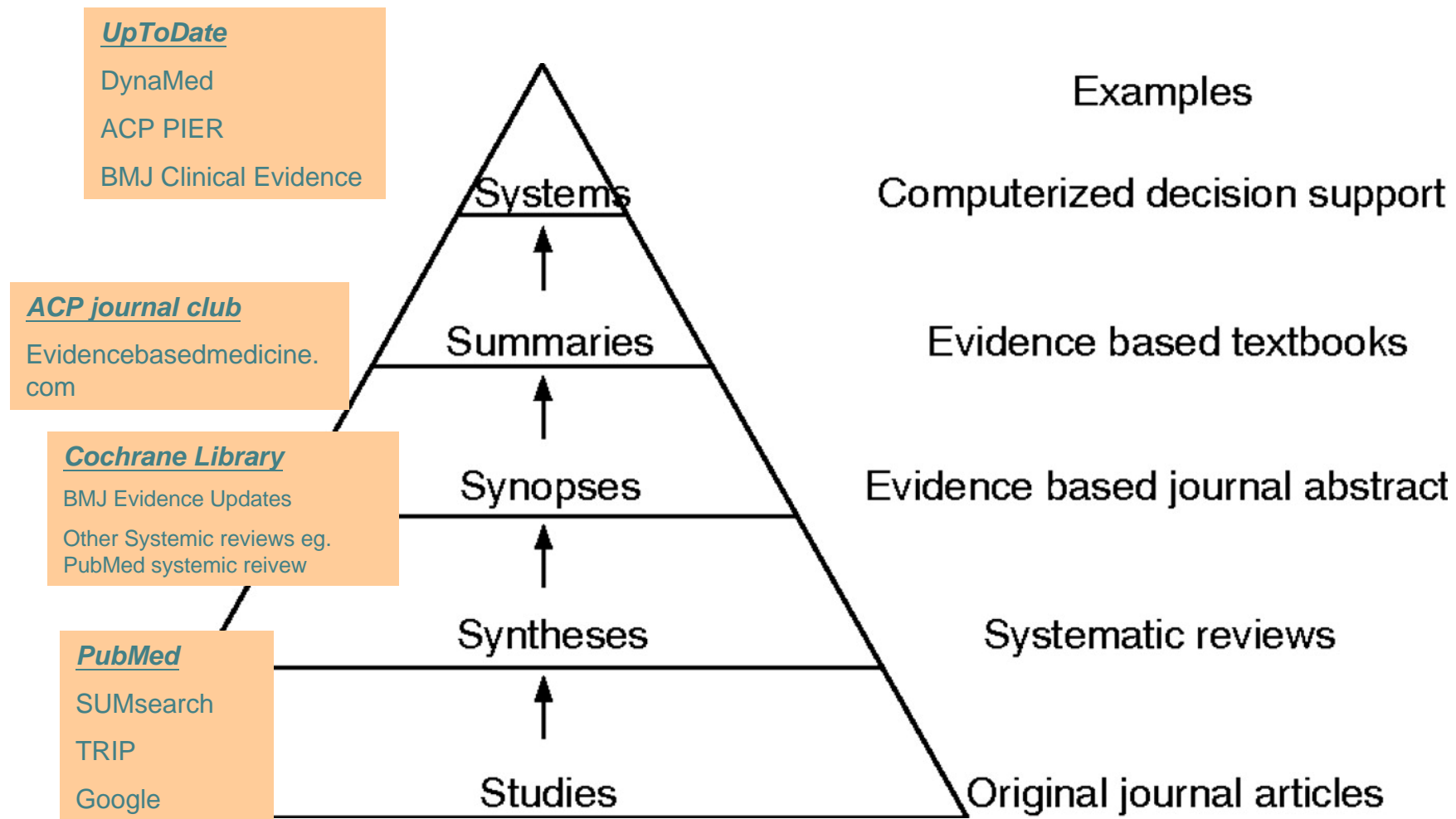


## Acquire-搜尋最有用的資料

- 先從已經過評讀的database開始找起(system, synopses, synthesis)
- 最後再找尚未經過嚴格評讀的study

# The "5S" levels of organisation of evidence from healthcare research

Brian Haynes, R Evid Based Med 2006;11:162-164



# Summaries



- UpToDate
  - Key words:
    - Throcolumbar vertebra compression fracture
    - Vertebroplasty
  - Article title:
    - Throcolumbar compression fracture

# Synopses

- ACP Journal Club
  - Key words:
    - Throcolumbar vertebra compression fracture
    - Vertebroplasty
    - Ballon kyphoplasty
  - Article title:
    - No match

# Syntheses

- Cocharne library
  - Key words:
    - Throcolumbar vertebra compression fracture
    - Vertebroplasty
    - Ballon kyphoplasty
  - Article title:  
*Comparing Pain Reduction Following Kyphoplasty and Vertebroplasty for Osteoporotic Vertebral Compression Fractures.* Pain Physician 2007; 10:583-590

Comparing Pain Reduction Following  
Kyphoplasty and Vertebroplasty for  
Osteoporotic Vertebral Compression  
Fractures

**Pain Physician 2007; 10:583-590**

J. Brian Gill, MD, Mark Kuper, DO, Paul C. Chin. PhD,  
Yan Zhang, PhD

**Meta-analysis**

# Objective

- To determine the amount of **pain reduction** using the **visual analog scale (VAS)** with kyphoplasty and vertebroplasty in the treatment of **osteoporotic vertebral compression fractures**.



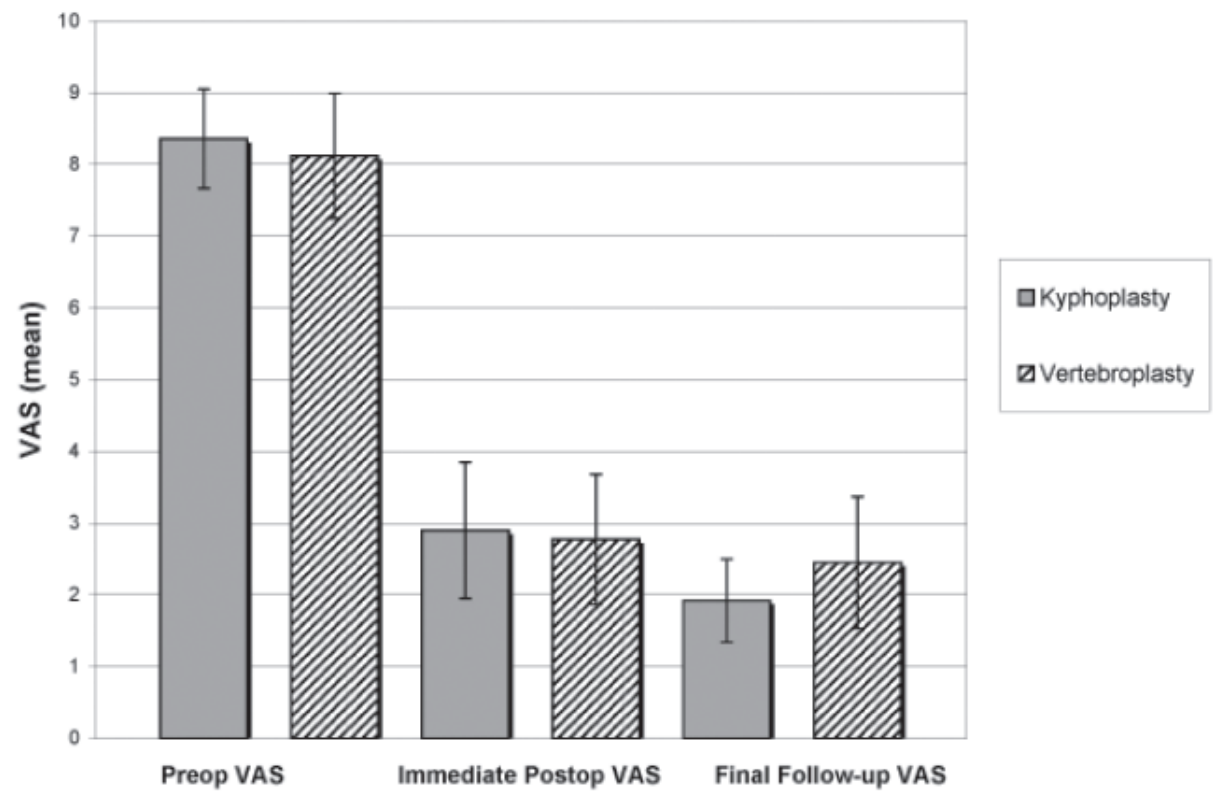
# Methods

- A **systematic review** and **meta-analysis** of the available literatures were performed
- visual analog scale (VAS)

# Results

- in the immediate postoperative period
  - Kyphoplasty and vertebroplasty resulted in a more than **5** point drop in the VAS ( $p < 0.00001$ ).
- Between the two
  - the difference in early pain relief was not significant.
  - At final follow-up, the long-term VAS was **improved for both** procedures
    - not significant when compared to the initial postoperative VAS ( $p = 0.25$ ,  $p = 0.38$ , respectively).

### VAS Scores



# Conclusion

- Both procedures reduce the amount of pain in the immediate postoperative period by approximately 50%.
- Both procedures reduce pain in symptomatic osteoporotic vertebral compression fractures that have failed conservative treatment.
- Randomized controlled trials are needed to provide definitive data on which procedure is the most effective for vertebral compression fractures.

# Studies

- PubMed
  - Key words:
    - Throcolumbar vertebra compression fracture
    - Vertebroplasty
    - Ballon kyphoplasty
  - Article title:
- *Comparison of kyphoplasty and vertebroplasty in the treatment of fresh vertebral compression fractures. Arch orthop Trauma Surg. 2009 Oct;129(10):1391-9. Epub 2009 May 27*



Comparison of kyphoplasty and vertebroplasty in  
the treatment of fresh vertebral compression  
fractures

**Arch Orthop Trauma Surg. 2009  
Oct;129(10):1391-9. Epub 2009 May 27.**

Markus Dietmar Schofer<sup>1</sup> , Turgay Efe<sup>1</sup>,  
Nina Timmesfeld<sup>2</sup>, Horst-Rainer Kortmann<sup>3</sup> and  
Markus Quante<sup>1</sup>

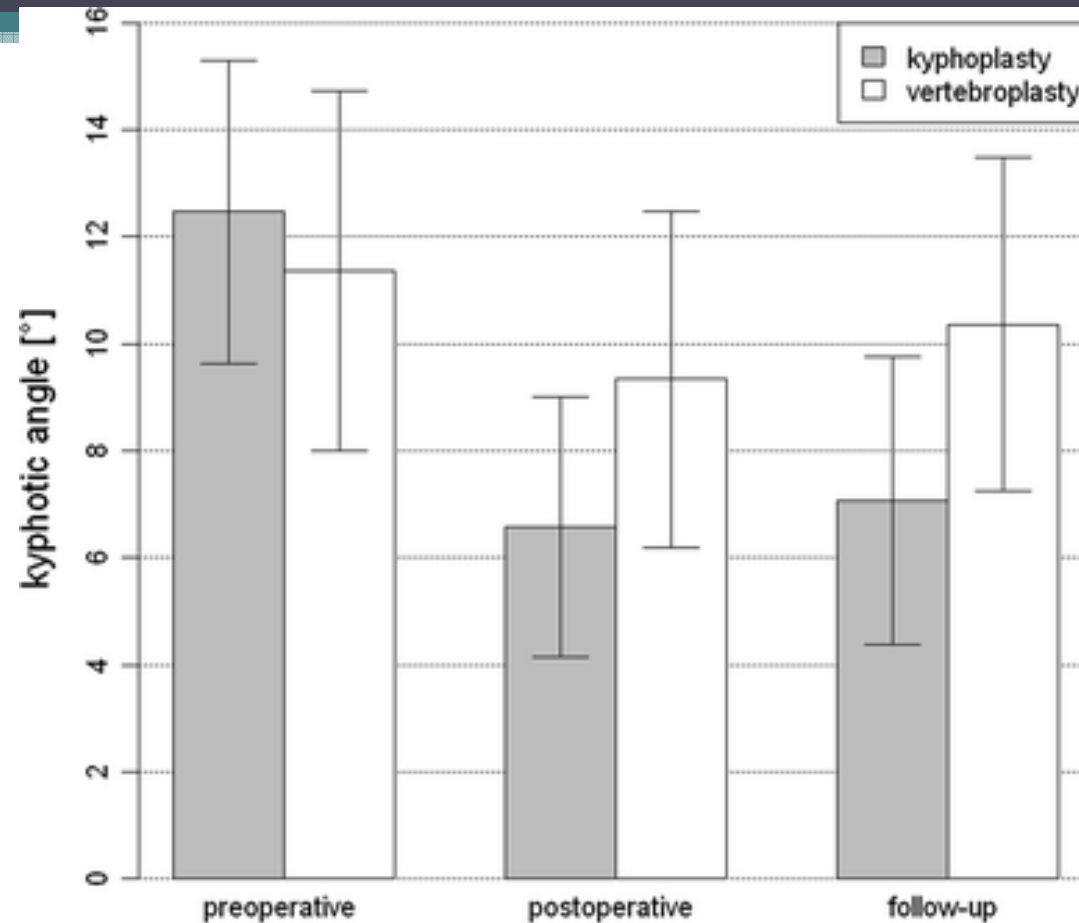


## *Materials and methods*

- The results of the two interventions were compared in a **prospective, nonrandomised cohort study**.
- The outcome of treatment was assessed with
  - the angle of kyphosis
  - back pain (VAS)
  - health-related quality of life (SF-36)
  - complications

- Both kyphoplasty and vertebroplasty
  - Significant improvement in the **angle of kyphosis** ( $P < 0.001$  and  $P = 0.002$ , respectively).
    - the angle was significantly ( $P < 0.001$ ) better in the **kyphoplasty** group.
  - Significant ( $P < 0.001$ ) attenuation of the **patients' pain**
    - no difference was observed between the groups in the degree of pain relief achieved.

- **Cement leakage** was observed in 7% of patients after kyphoplasty and in 33% of patients after vertebroplasty ( $P = 0.021$ ).
  - significantly lower in the kyphoplasty group
- **Adjacent-level fractures** were checked for, but occurred in only one patient in the vertebroplasty group



- the improvement in the **angle of kyphosis** was significantly more pronounced in the **kyphoplasty** group (postoperative examination:  $P < 0.001$ ; CI 3–5; follow-up:  $P < 0.001$ ; CI 3–6).



## *Conclusion*

- The two surgical procedures
  - significant pain relief
- **Balloon kyphoplasty** led to
  - Better height restoration
  - a lower rate of cement leakage.



# Apply to our patient

- In our patient
- Vertebroplasty for T11 compression fracture was done: Immediate relief of back pain

# Appraisal - 嚴格評讀


- **A:** Does this paper **answer** your question?  
**Yes.**
- **A:**
  - Is the **author** an expert of the field?  
**Yes.**
  - Is there any conflict of interest?  
not mentioned

# Method: 證據等級 (針對PubMed這篇)

Level	與[治療/預防/病因/危害]有關的文獻
1a	用多篇RCT所做成的綜合性分析(SR of RCTs)
1b	單篇RCT(有較窄的信賴區間)
1c	All or none
2a	用多篇世代研究所做成的綜合性分析
2b	單篇cohort及低品質的RCT
2c	Outcome research / ecological studies
3a	SR of case-control studies
3b	Individual case-control studies
4	Case-series(poor quality :cohort / case-control studies)
5	沒有經過完整評讀醫學文獻的專家意見

## Method: 證據等級

- **Level**
- 與【治療/預防/病因/危害】有關的文獻
- 針對Cochrane這篇：2a: 用多篇世代研究所做成的綜合性分析
- 針對Pubmed這篇：3a: SR of case-control studies

- 
- Apply-臨床應用  
結合醫學倫理方法  
將study的結果應用在病人身上

## 4 box

- 醫療現況: Treatment of vertebra compression fracture is still controversial as to conservative treatment (bed rest) or surgical intervention (vertebroplasty or ballon kyphoplasty). Surgical intervention seems to offer immediate pain relief and is the next step when conservative treatment fails.
- 病人意願: Carefully explain the advantages and disadvantage(side effects) of the surgery.
- 生活品質: Pain relief may offer a better quality of life to patient.
- 社會脈絡: for old-age patients, it allows the caregiver a easier way to care patients.

# Audit-自我評估

- 在「提出臨床問題」方面的自我評估
- 我提出的問題是否具有臨床重要性？ **Yes, osteoporotic related compression fractures are very common in old-age patients even without trauma history. Immediate pain relief seems to be the most important factor when searching for treatment.**
- 我是否明確的陳述了我的問題？
  - 我的foreground question 是否可以清楚的寫成PICO？ **可**
  - 我的background question 是否包括what, when, how, who等字根？ **是**
- 我是否清楚的知道自己問題的定位？（亦即可以定位自己的問題是屬於診斷上的、治療上的、預後上的或流行病學上的），並據以提出問題？ **知道，屬於治療**
- 對於無法立刻回答的問題，我是否有任何方式將問題紀錄起來以備將來有空時再找答案？ **有**

## 在「搜尋最佳證據」方面的自我評估

- 我是否已盡全力搜尋？**是**
- 我是否知道我的問題的最佳證據來源？**是**
- 我是否從大量的資料庫來搜尋答案？**是**
- 我工作環境的軟硬體設備是否能支援我在遇到問題時進行立即的搜尋？**是**
- 我是否在搜尋上愈來愈熟練了？**是**
- 我會使用「斷字」、布林邏輯、同義詞、MeSH term，限制 (limiters) 等方法來搜尋？**部份會**
- 我的搜尋比起圖書館人員或其他對於提供病人最新最好醫療有熱情的同事如何？**仍需加強**

## 關於「嚴格評讀文獻」方面的自我評估

- 我是否盡全力做評讀了？仍有不熟悉的部份
- 我是否了解Number need to treat 的意義？了解
- 我是否了解Likelihood Ratios的意義？大概了解
- 我是否了解worksheet每一項的意義？不太了解
- 評讀後，我是否做出了結論？是

## 關於「應用到病人身上」的自我評估

- 我是否將搜尋到的最佳證據應用到我的臨床工作中？**是**
- 我是否能將搜尋到的結論如NNT, LR用病人聽得懂的方式解釋給病人聽？**尚待加強**
- 當搜尋到的最佳證據與實際臨床作為不同時，我如何解釋？**實證醫學是以目前的研究為基礎，分析統計後得到可能較佳的作法，並不一定適於每位病人，在臨床運用上，仍需評估實際症狀及療效**

## 改變「醫療行為」的自我評估

- 當最佳證據顯示目前臨床策略需改變時，我是否遭遇任何阻止改變的阻力？目前臨床策略尚無需改變
- 我是否因此搜尋結果而改變了原來的治療策略？做了那些改變？否，目前的作法符合EBM的建議



Thanks for your attention!