

# Cost-Benefit of Vertebral Augmentation: How to Assess the Benefit

## LETTER TO THE EDITOR:

We read the article "Vertebral augmentation versus conservative therapy for emergently admitted vertebral compression deformities: An economic analysis" (Pain Physician 2013; 16:441-445) (1) with great interest. The authors compared 39 inpatients who had undergone vertebral augmentation (VA) with 209 medically treated patients. The authors found that daily cost was the same between the VA and medically managed groups. The results showed a tendency of lower 30-days readmission rate in VA group without statistical significance. The authors drew the conclusion that VA could be a cost-effective treatment for inpatients with painful osteoporotic vertebral fractures (OVFs). However, as an average hospital stay was longer in the VA group than that in the medically treated group, total cost was significantly higher in the VA group in this research.

To further assess the cost-benefit of VA, we repeated their research methods in our inpatients with OVFs admitted last year (Jan 1, 2013 to Sep 31, 2013). The results are shown in Tables 1 and 2.

In this series, we performed a questionnaire about satisfaction with treatment outcome. Three questions were included:

1. Are you satisfied with the outcome?
2. Did you know that vertebral augmentation costs about thirty thousands yuan per patient, while the medical management costs about four thousands yuan per patient?
3. Now you know the cost of both treatments. If you could choose again, which one is your choice, vertebral augmentation or medical management? (Table 3)

In our series, there was no statistical difference in demographic data between both groups. Case mix index, length of stay, readmission rate and home discharge were similar in both groups. VA showed a significantly higher total cost and daily cost ( $P < 0.001$ ). This was caused mainly by the high cost of surgical instruments and low charge for labor under our medical care system. A set of instruments for a single level VA demands about 21,000 CNY (\$3,360 USD), while doctors' daily visit was free and daily room fee is up to 120 CNY (\$20 USD).

The results also showed a higher satisfaction rate in the VA group (84.1% vs 55.6%). The results indicated that 93.2% of patients (41/44) undergoing VA considered the cost was worthy, while about one-third of patients (6/18) originally receiving medical treatment would prefer to spend more money for the possibility of better outcomes.

Although the cost of VA was much higher under our medical care system, we still considered that VA should be a first-line treatment for patients with painful OVFs, especially severely disabled patients. VA has a good result of pain relief, which has been proven by

Table . Demographic Data.

|                    | VA   | Medical Management |
|--------------------|------|--------------------|
| Number of Patients | 44   | 18                 |
| Average Age        | 77.8 | 76.4               |
| Men/Women          | 7/37 | 7/11               |
| Case Mix Index*    | 1.1  | 1.5                |

\*Case Mix Index: comorbidities per patient

Table 2. Comparison of VA and medically managed patients.

|                                       | VA            | Medical Management | P-Value |
|---------------------------------------|---------------|--------------------|---------|
| Length of stay (days)                 | 3.6           | 2.8                | P=0.19  |
| Total Cost (CNY/USD)*                 | 30,455/4872.8 | 4,307/689.1        | P<0.001 |
| Cost/Day (CNY/USD)*                   | 10,305/1648.8 | 1,337/213.9        | P<0.001 |
| Readmission Rate (>60 days follow-up) | 0             | 6%(1/18)           | P=0.29  |
| Home Discharge                        | 91%           | 83%                | P=0.40  |

\*CNY: Chinese Yuan. USD: United States Dollar.

Table 3. Analysis of satisfaction with outcome.

|                                    | VA   | Medical Management | P-Value |
|------------------------------------|------|--------------------|---------|
| Q1(Yes/No)                         | 37/7 | 10/8               | P<0.05  |
| Q2(Yes/No)                         | 44/0 | 11/7               | P<0.01  |
| Q3<br>(Same choice/Changed choice) | 41/3 | 12/6               | P<0.01  |

many studies. More importantly, patients undergoing VA have a better quality of life (2-4). A meta-analysis published in 2013 showed strong evidence that cement augmentation had better outcomes than nonoperative or sham treatments (5). More specifically, functional outcome and health-related quality of life was significantly in favor of vertebroplasty (5). These high-level studies suggest that vertebroplasty might be a cost-effective treatment all over the world, even under different cost structures in different areas.

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