

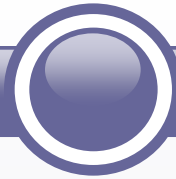


Cancer Patient Fracture Evaluation: CAFÉ

A Multinational Controlled Study to Compare Balloon Kyphoplasty to Non-Surgical Fracture Management in the Treatment of Painful, Vertebral Body Compression Fractures in Cancer Patients

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T Ashraf, FD Vrionis**

For the CAFE Study Investigators



Study Objective & Design

The primary objective of the CAFÉ study was to evaluate the safety and effectiveness of balloon kyphoplasty treatment for painful VCFs as compared to standard non-surgical therapy in patients with cancer.

- Multicenter, randomized, controlled trial.
- Balloon kyphoplasty(BKP) vs. Non-surgical management(NSM)
- Patient randomization was stratified by study center, gender, and cancer type (1:1)
- Originally, study was designed to enroll 200 subjects. Pre-planned sample size re-evaluation assessed only 86 patient were needed. Enrollment stopped at 134 patients
- Cross-over to balloon kyphoplasty permitted after 1 month
- Follow-up visits: 7-10 days and at 1, 3, 6, 12 months

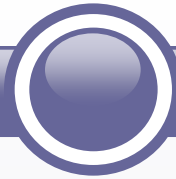
Study Design: major inclusion/ exclusion

Inclusion criteria

- Adult patients diagnosed with variety of cancers
- ≤ 3 painful acute VCFs T5-L5
- Score ≥ 4 on 0 to 10 numeric pain scale
- RMDQ score ≥ 4 on scale of 0 to 24
- Life expectancy > 3 months
- No change in chemotherapy regimen planned 1 month prior to or following patient enrollment (except dose change)

Exclusion criteria

- Spinal cord compression
- Primary bone tumors at index VCF
- Osteoblastic tumors at index VCF
- Solitary plasmacytoma at the fracture site
- Platelet count $< 20,000$ at time of hospital admission
- High dose steroid treatment, IV pain medication or nerve block to control chronic back pain
- BKP technically not feasible



Clinical endpoints

Primary endpoint

Change in functional status from baseline to 1 month as assessed by the **Roland Morris Disability Questionnaire**

Secondary endpoints

Change in **Quality of Life** as assessed by the SF-36v2™

Change in **Karnofsky Performance Scale**

Change in **back pain**, as measured by a 10-point numerical rating scale (NRS)

Change in back pain **analgesics** used

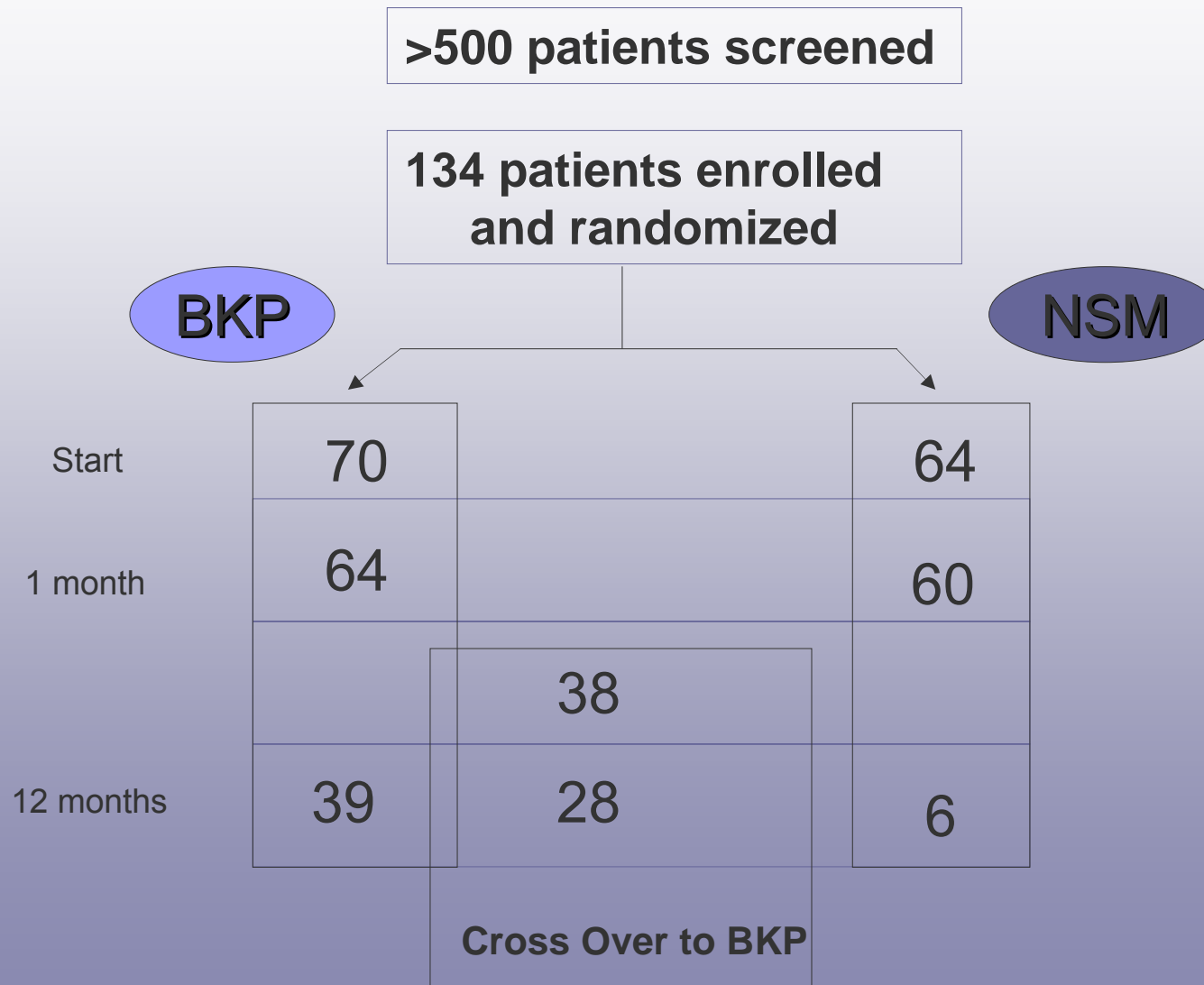
Change in **ambulation status and activities of daily living**

Radiographic Assessment (Spinal deformity, height restoration, subsequent fractures)

Safety evaluation:

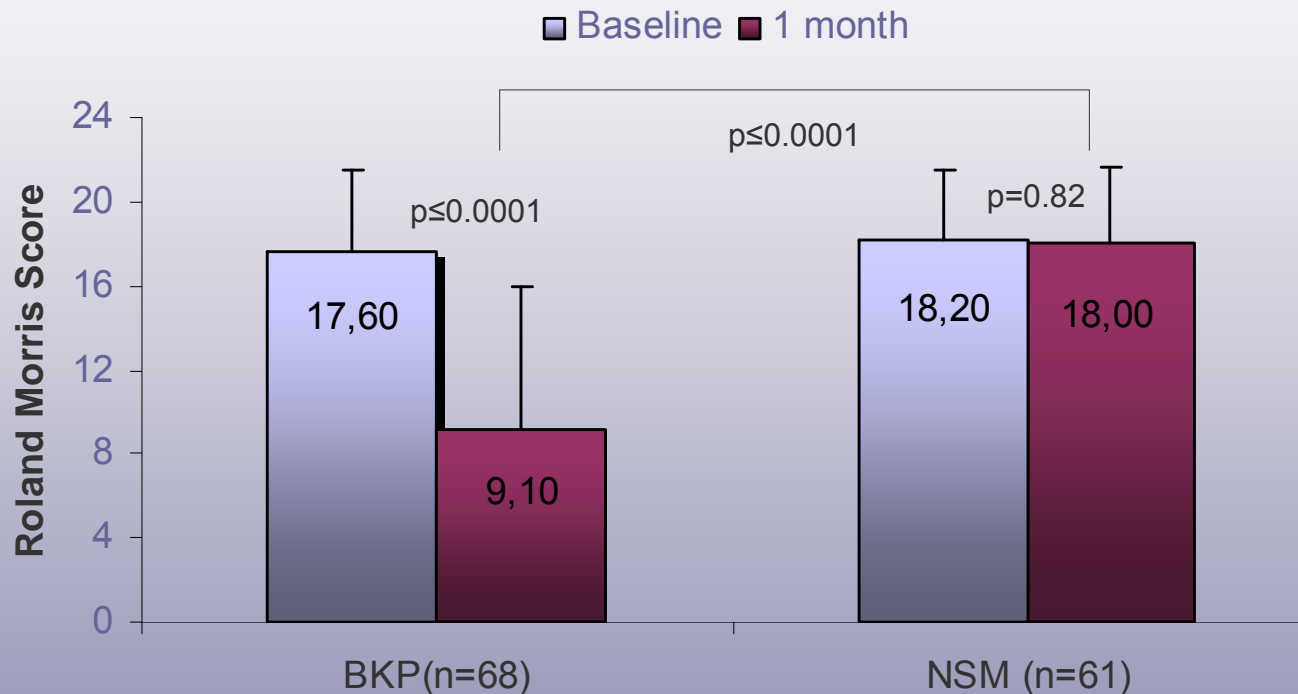
Evaluation of Adverse Events, Serious Adverse Events, and Deaths

Patient Enrollment



Primary endpoint

Change in RMDQ at 1 month



The treatment difference between BKP group and NSM group in change in RMDQ score from baseline to 1 month was -8.4 ($p \leq 0.0001$)

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Clinical endpoints

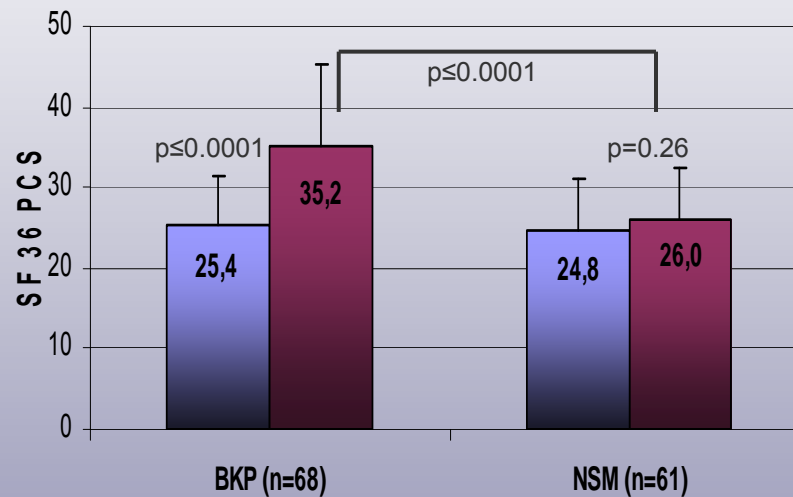
Change in Back Pain Score from Baseline

	BKP	NSM	p-value
Number of patients	68	61	
Baseline mean VAS	7,3	7,3	
Change in mean VAS at day 7	-3,8	-0,3	≤ 0.0001
Change in mean VAS at Month 1	-3,9	-0,6	≤ 0.0001

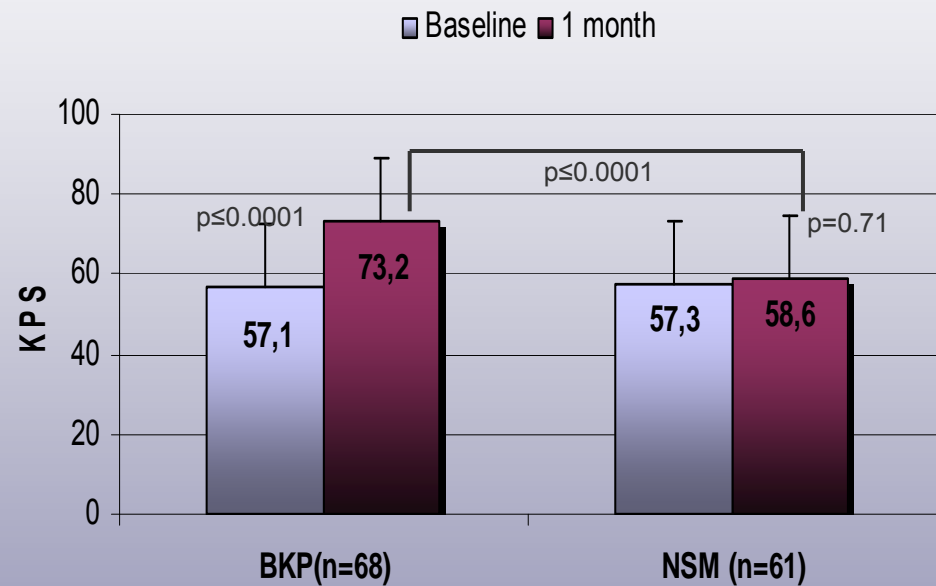
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Clinical endpoints at 1 month

SF-36 PCS



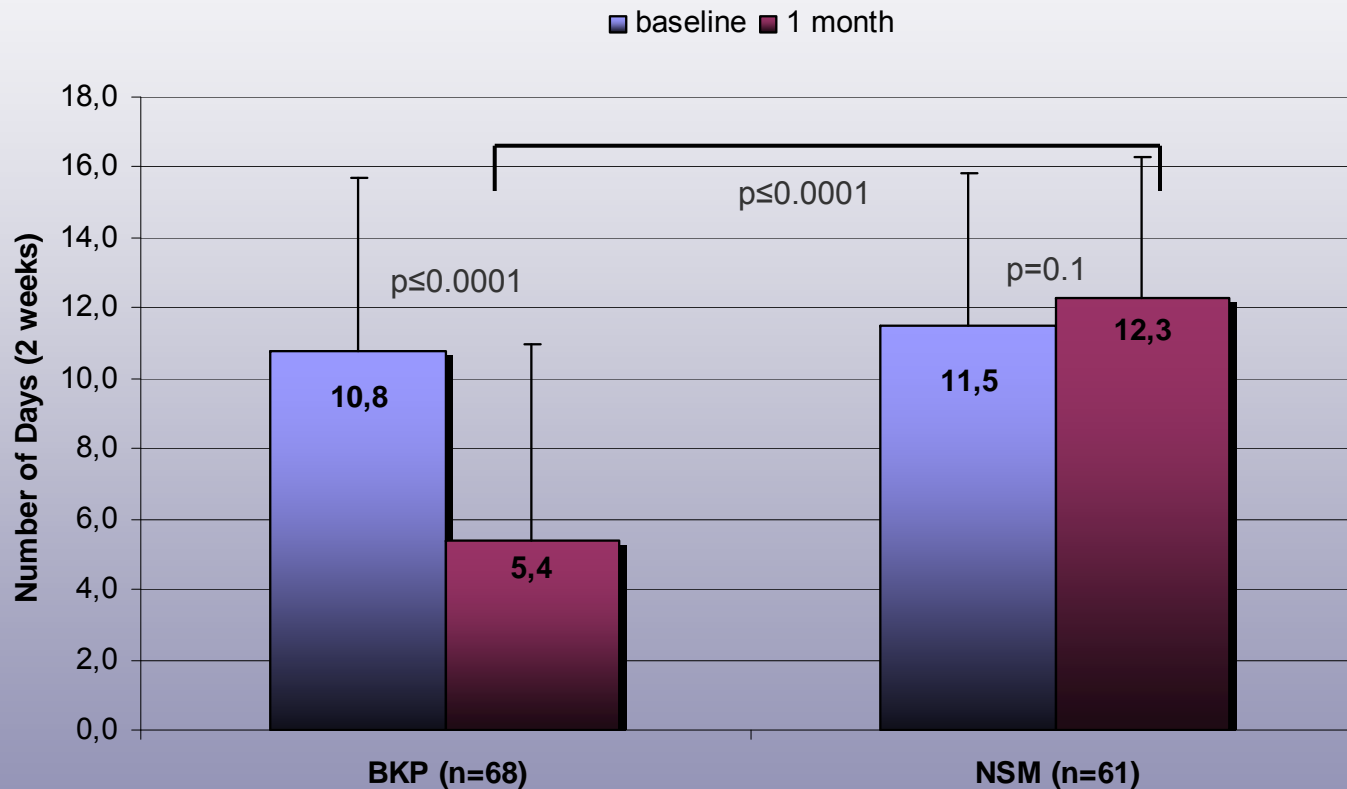
Karnofsky Performance Scale



The BKP group showed statistically significant mean improvements from baseline to 1 month for all SF-36 subscales ($p \leq 0.0001$), the treatment difference in KPS score from baseline to 1 month was 15.3 ($p \leq 0.0001$)

Clinical endpoints

Reduced activity due to Back Pain



At 1 month the treatment difference between the BKP group and NSM group was 6.3 days per 2 weeks ($p < 0.0001$)



Safety evaluation

- Medical Adverse Events are similar between groups
- One kyphoplasty patient had an intraoperative non Q-wave MI with intermittent atrial fibrillation SAE that was attributed to anesthesia and resolved
- One kyphoplasty patient with a cement leakage to the disc had an adjacent fracture SAE occur 1 day after the index procedure; the local investigator judged this to be device-related
- A Crossover patient had a new fracture 13 days after surgery; the local investigator judged this possibly device-related
- No significant difference between the groups in the number of patients with clinical or radiographic new fractures at 1 month



Conclusions

- The primary endpoint (RMDQ) was statistically significant greater following BKP compared to NSM
- The secondary clinical endpoints (SF-36 PCS, VAS back pain, Karnofsky score, pain medication) demonstrated greater improvements at 1 month with BKP compared to NSM.
- Patients who crossed over to BKP showed similar results to those initially randomized to BKP and improvements in clinical endpoints were maintained until the end of the study
- NSM provided small gradual improvements over time but result interpretation is limited by small patient numbers at longer term
- The incidence of adverse events considered device related was low (<5% of patients in surgical group)



Disclosure statement:

Dr Pflugmacher , Dr Berenson , Dr Jarvis and Dr Vrionis received consultancy honoraria for Medtronic LCC

J Tillman and T Ashraf report being employed and owning stock in Medtronic