

Lumbar disc biologic autograft injection of bone marrow aspirate for treatment of low back pain: a retrospective review of 24 cases.

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Introduction

Autologous bio-cellular grafts are increasingly encountered in surgical literature as a means to enhance tissue repair. Biologic graft use has expanded beyond simple platelet rich plasma to encompass mesenchymal cell preparations including bone marrow aspirate cell concentrate (BMAC) and adipose derived autologous cell products. The clinical application of such grafts in the treatment of low back pain is intriguing, but remains unproven.

Low back pain of lumbar discogenic origin is often refractory to treatment measures including aggressive exercise physiotherapy, lifestyle changes, medication management, and interventions such as epidural steroid deposition. Individuals with persistent pain are often faced with the choice of pursuing spine surgery, including lumbar interbody fusion.

Hypothesis

We hypothesized that injection of bone marrow mesenchymal cell concentrate (BMAC) into degenerated lumbar discs would relieve low back pain of discogenic origin.

Materials and methods

Retrospective data were collected from 24 consecutive individuals treated in the primary author's clinic over 30 months. Full disclosure regarding the experimental nature of the treatment was provided and written informed consent obtained. All patients presented with chronic low back pain plus MRI or CT evidence of lumbar disc degeneration. Clinical findings were consistent with low back pain of discogenic origin.

•17 males, 7 females

•Median age 45 years (Range 28-64 yrs)

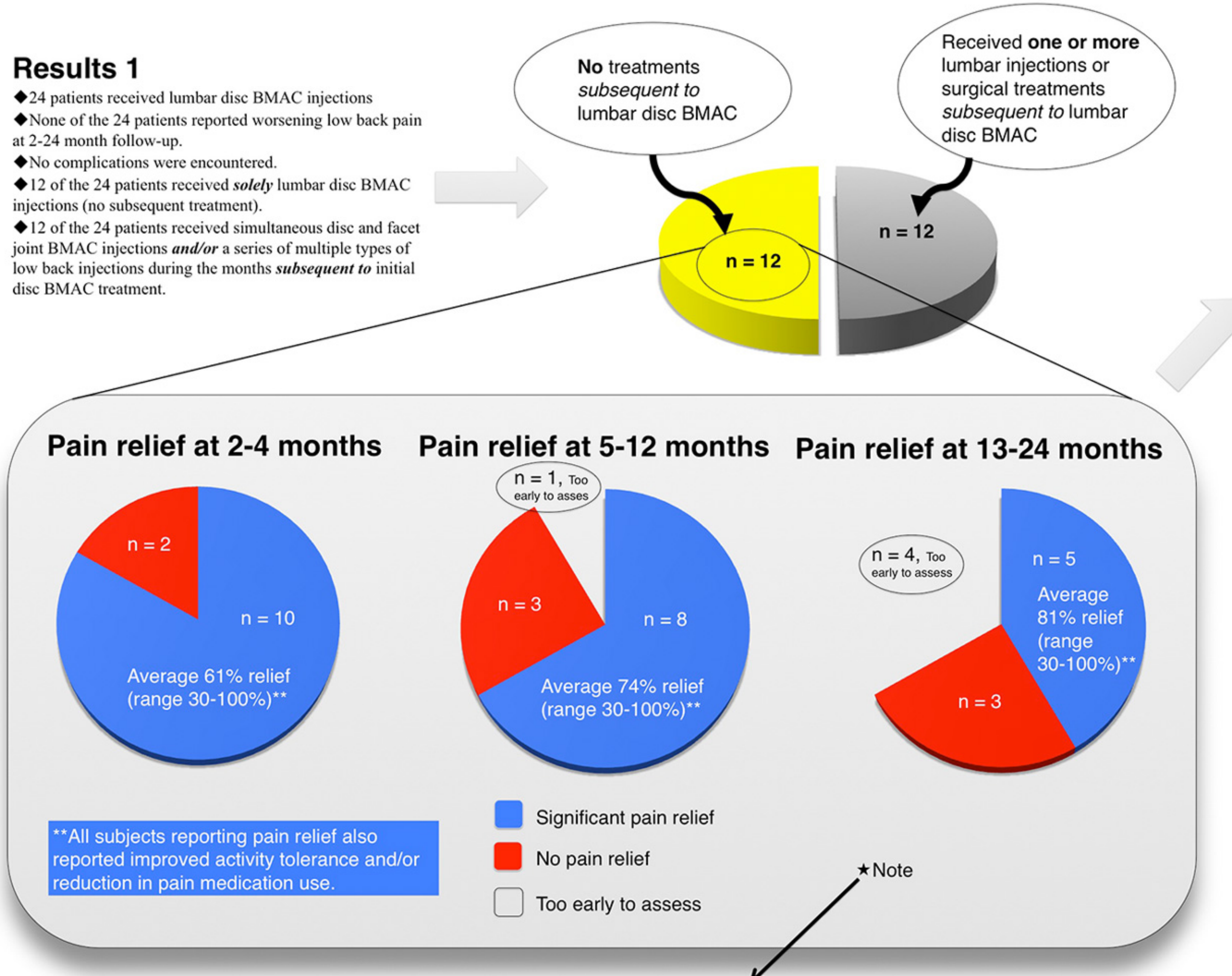
•Duration of low back pain: Average 4 years (SD 4 yrs; range 0.25-12 years).

•Provocative discography performed in 8 cases.

Iliac bone marrow aspirate (60 cc) was harvested and concentrated in an Emetec centrifuge device to obtain 6-8 cc BMAC: 1-1.5 cc of which was injected into each affected lumbar disc using a 22 gauge Chiba needle under fluoroscopy, followed by injection of an additional 0.5-1 cc of BMAC immediately external to the annulus. This in turn was followed by injection of 10 mg of triamcinolone (also external to the disc) to minimize post-procedure irritation. All disc injections were performed at the L4-5 and/or L5-S1 disc levels (maximum of 2 discs treated). Follow-up data were obtained up to 36 months post-treatment.

Results 1

- ◆24 patients received lumbar disc BMAC injections
- ◆None of the 24 patients reported worsening low back pain at 2-24 month follow-up.
- ◆No complications were encountered.
- ◆12 of the 24 patients received *solely* lumbar disc BMAC injections (no subsequent treatment).
- ◆12 of the 24 patients received simultaneous disc and facet joint BMAC injections *and/or* a series of multiple types of low back injections during the months *subsequent to* initial disc BMAC treatment.



Results 2

In the 12 patients treated solely with disc BMAC:

- ◆At 5-12 months, 8 reported significant pain relief, and 3 reported no relief, while it was too early to assess in 1.
- ◆At 13-24 months, 5 continued to report significant pain relief, and 3 continued to report no relief, while it was too early to assess in 4.

Conclusions

- ◆While these observations are encouraging and appear to support the hypothesis that BMAC disc injection is capable of significantly relieving low back pain of discogenic origin, *the nature of this study (uncontrolled retrospective case review) does not allow statistical conclusions to be drawn.*
- ◆Nevertheless, these observations **do support** the need for future controlled prospective study of biologic autograft treatment of lumbar discogenic pain.

References

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