Marrow Cellution:
Autograft Bone Harvested from the Iliac Crest use in Challenging Fusion

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OVERVIEW / DISCUSSION

Success in challenging fusion cases can be enhanced when the site is augmented with autograft bone harvested from the iliac crest. This procedure is generally considered the “gold standard” for complicated fusion procedures. However, graft harvests in certain instances have been associated with long-term complications and significant pain. A new device (Marrow Cellution or MC) which aspirates bone marrow from the iliac crest (and other bones with reservoirs of stem cells) provides a less invasive alternative to traditional autograft harvest. Additionally, while traditional aspiration retrieval methods use open-ended trocars which diminish the number of key stem and progenitor cells due to the peripheral blood that enters the trocar, the MC device is close-ended and requires no manipulation of the aspirate as there is no centrifugation needed, so no processing of the aspirate outside of the sterile field. Thus the MC Device may create the functional equivalent of traditional autograft without the associated morbidity or increased sterility risks associated with off-field processing steps.

The Marrow Cellution aspiration kit provides 1) minimally invasive harvesting of intact bone dowels and 2) aspiration of marrow while minimizing peripheral blood infiltration. Harvesting an intact cancellous bone dowel which does not disrupt the highly organized living tissue of the bone is different from transplanting pieces of bone. Such grafts that maintain the micro-vascular within the graft do not show extensive resorption with the inherent difference based on the ability of intact bone to exploit the biology of normal fracture healing rather than through creeping substitution.

Clinical History

The patient is a 54-year-old female who had tripped and fell, striking her head on the ground which resulted in a scalp laceration and a cervical spine fracture of the superior articular facet of C7. She initially described heaviness and weakness in her left arm, but did not believe she suffered any loss of consciousness from the injury. She did report to the emergency department for initial evaluation and treatment. She was treated and subsequently released in a hard-cervical collar. Upon initial evaluation, she was found to be myelopathic with severe multilevel central canal stenosis as reflected in her MRI results.

Findings & Treatment

Recommendation was made for an anterior cervical discectomy and fusion from C3-C7 with allograft bone and instrumentation.

Surgical Procedure:

The patient underwent the surgery as was recommended. To prepare the required bone grafting material, a bone marrow aspiration and a bone dowel harvest was performed from the Iliac crest using an anterior approach.

The “Marrow Cellution” Autologous Bone Marrow Aspiration kit was used to aspirate bone marrow and to harvest the bone plugs from the anterior iliac crest.

Creating the Graft

Live cells from the bone marrow aspirate were used to hydrate the allograft.

Follow-up

The surgery was without complication and patient was discharged from the hospital on postoperative day #1. At her final follow-up she was asymptomatic with complete resolution of her upper extremity pain and numbness as well as a radiographically solid fusion from C3-C7.

CONCLUSION

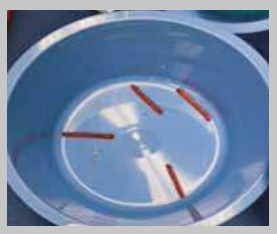
The Marrow Cellution kit can be used to provide high quality bone marrow aspirate and intact bone dowels. Combining aspirate plus dowels with an allograft graft extender will create a bioactive graft material suitable with a cell content comparable to autograft with minimal morbidity that is for use in spine fusion.

Anterior Superior Iliac Spine was marked, prepped and draped in sterile fashion.

The Marrow Cellution bone marrow harvesting technique was then performed

Care was taken to draw only one cc of aspirate from each position in the ileum, working distal to proximal.

Bone Dowel Harvested



Dowels Collection

Live cells from the bone marrow aspirate were used to hydrate the allograft.

3 Month Post Op

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