

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

Jeffrey R. Gleimer, DO  
Regional Orthopedic P.A. - Cherry Hill Office

## 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 required so no processing of the aspirate outside of the sterile field. Thus, the MC Device may create the functional equivalent of 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

During the patient's initial orthopedic spinal consultation, the 45-year-old gentleman informed the physician that he had experienced approximately 20 years of lower back pain. He previously worked as a carpenter and was currently working as a cook at the time of the initial evaluation. He described the inability to stand in one position for any period of time without significant worsening of lower back pain. He described, secondarily, pain that traveled into the right buttock region. He was unable to sit without a back support for any prolonged period of time. He described the pain as a 9 out of 10 in severity and constant, with worsening severity depending on his activity level.

## Findings & Treatment

A recommendation was made for a 2-level instrumented fusion of L4-5 and L5-S1 secondary to herniated disks and severe foraminal stenosis. The patient subsequently underwent a combined anterior and posterior lumbar interbody fusion with unilateral percutaneous pedicle screw fixation.

## Surgical Procedure:

The “Marrow Cellution” Autologous Bone Marrow Aspiration Kit was used to aspirate bone marrow and harvest bone plugs from the previously prepped posterior iliac crest.

### Creating the Graft

Live cells from the bone marrow aspirate were used to hydrate the allograft. The collection spoon containing the bone dowels was inserted into the center of the dry graft extender contained in the graft delivery syringe. Using the push rod, the dowel was inserted into the center of the dry graft extender. The dry graft material was then hydrated with the marrow aspirate to create the bone log. Vascularized intact bone cores run along the center of the graft from end to end, surrounded by bone chips hydrated with marrow aspirate. The mixture of live cells from bone marrow aspirate, autograft, and allograft was used to fill the inter body spacer.

## Follow-up

The patient's last follow-up was 1 year from his surgical date with greater than 60% improvement of his preoperative pain and was able to return to work full time as a cook 4 months postoperatively.

## CONCLUSION

The Marrow Cellution Kit can be used to provide high quality bone marrow aspirate and intact bone dowels. Combining aspirate plus dowels with a graft extender will create bioactive bone logs with a cell content comparable to autograft with minimal morbidity that is suitable 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



The dry graft material was then hydrated with marrow



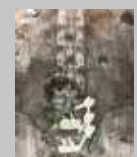
Mixture of live cells from bone marrow aspirate



Three Months



Three Months



One Year



One Year



One Year



One Year