Anterior Lumbar Interbody Fusion Treated With Concentrated Autologous Adult Stem Cells (BMAC™) and Cancellous Bone Chips

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Pre and Post Operative Diagnosis (2/23/07)
- L3-L4 Nonunion, back pain
- Lateral projection lumbar x-ray demonstrates nonunion at L3-4

Operation Performed: (4-17-07)
- Removal of L3-L4 interbody devices; for previous failed fusion surgery
- L3-L4 anterior approach lumbar interbody fusion using 10 mm InFix® cage with 12 mm lordosis.
- Left iliac crest bone marrow aspiration (to be concentrated)
- Anterior arthrodesis using bone marrow aspirate concentrate (BMAC™) and cancellous bone chips.
- L3-L4 anterior plate fixation.

Clinical History:
60 YO female who has had continued lower back and lower extremity pain since March 2005. Patient has had two previous surgeries to correct her lower back and lower extremity pain:
- Left laminectomy with foraminotomy in June, 2005
- L3-4, L4-5 decompression fusion procedure with screws at L4-5, interbody fusion at L3-L4 & L4-L5 (July 2006). Pedicle screws were not placed at L3-L4 because of softness of her bone and small pedicles resulting in break-out.

Patient continued to experience progressive low back pain left-sided radicular pain and numbness in her foot. Symptoms continued to worsen. L3-L4 did not fuse. We decided to remove the interbody device and do an anterior interbody fusion using BMAC™ and cancellous bone chips with an InFix cage.

Description of Operation:
Bone Marrow Aspiration:
After the patient was properly identified and informed consent was obtained, patient was brought to the operating room. The left anterior crest region was prepped and two finger breadths behind the ASIS, a small stab incision was made. An 11 gauge aspiration needle with multiple side holes (to maximize cell yield) was used to aspirate 60 cc of bone marrow aspirate. The 60 cc of bone marrow aspirate was transferred to the SmartPreP® System (Harvest Technologies Corp. Plymouth, MA) for concentration. Approximately 15 minutes after processing, 10 cc of bone marrow aspirate concentrate (BMAC™) was available – providing the concentrated cells required for the graft/fusion.
Removal of L3-L4 Interbody Devices:
- Anterior approach; left paramedian
- Interbody cages identified and removed with curette discectomy; endplates repaired

Anterior Lumbar Interbody Fusion Surgery:
- Template used to determine proper InFix device; 10 mm cage was selected with 12 mm of lordosis, 9 mm inferiorly and 3 mm superiorly.
- Cage was placed within disc space; posterior aspect of cage in line with posterior aspect of vertebral bodies – L3 - L4.
- Disc height restored
- Packed cage with BMAC™ and morselized cancellous bone chips
- Anterior Plate Fixated

Results: November 26, 2007 (7 months post op):
- Patient has some ongoing low back pain and is neurologically stable.
- Lumbar CT demonstrates post-surgical changes of anterior lumbar spine fusion with metallic device and graft material with solid fusion at L3-4. (figure 2)