Calcium Phosphate Based Synthetic Bone Construct (SBC) As A Temporary Spacer For Bone Defect Before Bone Transport

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INTRODUCTION:

Bone defect following resection of unhealthy bone often become contracted and fill with fibrous tissue. This will lead to resistance during bone transport, fibrous tissue interposition and skin invagination at the docking site. We report a case where synthetic bone constructs (SBC) was used as a temporary spacer to prevent valley formation and soft tissue interposition during bone transport. The SBC dissolved slowly and thus allowing the bone to be transported with minimal resistance and preventing fibrous tissue formation in the bone gap.

METHODS:

A 30 year-old lady had a 4 cm bone gap following resection of unhealthy bone for non-union following open grade IIIB distal tibia fracture. The gap was filled with SBC and ilizarov circular frame was assembled for bone transport. SBC is a biodegradable osteoconductive material made from calcium phosphate based materials. It is manufactured by Granulab (M) Sdn Bhd in a GMP accredited factory and certified by British Standard Institute (BSI). 5 cc of SBC was mix with 4 mls of bone marrow aspirate in a cup. It is mix in a sterile OT environment and put in a mold to make it into small pellet. The mixture was allowed to be hardened for 20 minutes before inserted into the bone defect.

RESULTS:

The transported segment docks after 2 month. There was no skin invagination and valley formation. When the docking site was opened, the gap was filled with partially dissolved calcium phosphate. There was minimal soft tissue interposition.

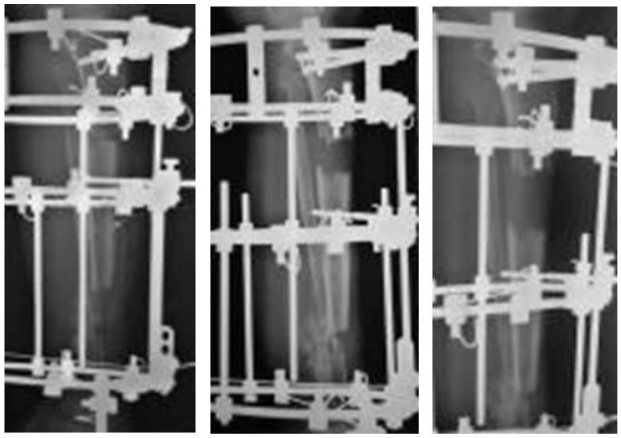

Figure 1: Plain radiograph post op, 1 month and during docking

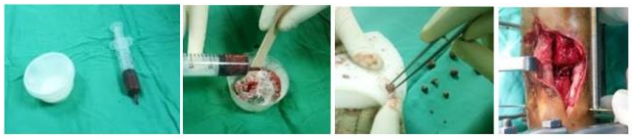

Figure 2: Clinical picture during mixing of SBC with marrow aspirate, making pellet using mold and opening of docking site showing calcium phosphate material with minimal fibrous tissue interposition.

DISCUSSIONS:

Although calcium phosphate has osteoconductive property, we did not observe any any bone formation at the gap although we mix it with bone marrow aspirate. Calcium Phosphate can also be used as an antibiotic carrier for local slow release delivery following resection of infected bone.

CONCLUSION:

Calcium phosphate is effective as a temporary spacer to fill the gap during bone transport.

REFERENCES:

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