

Research Article

PERCUTANEOUS AUTOGENOUS INJECTION OF BONE MARROW ASPIRATE CONCENTRATE FOR MANAGEMENT OF DELAYED UNION IN SCAPHOID FRACTURES – OUR EXPERIENCE

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INTRODUCTION

Bone marrow injections have been long used to treat delayed unions in the past with varied results. Many problems have been encountered while harvesting and injecting bone marrow, like the amount of bone marrow needed for injection, the site of aspiration, space available for injection at the recipient site, patient positioning for aspiration and for injection. We have used BMAC injection for the treatment of delayed union in scaphoid fractures.

We have attempted to aspirate bone marrow from anterior iliac crest instead of traditionally obtaining from posterior iliac crest. We had concentrated the bone marrow aspirated, so that the amount to be injected will be less, while preserving the efficacy of the injection.

Bone Marrow Aspirate Concentrate

Bone marrow obtained by iliac crest aspiration is a common source for harvesting mesenchymal stem cells, other progenitor cells, and associated cytokine/growth factors. The use of bone marrow aspirate concentrate (BMAC) is currently approved by the United States Food and Drug Administration. Commonly bone marrow is aspirated from posterior iliac crest. In our test study we obtained bone marrow from anterior iliac crest, thus preventing tedious position change during surgery and reduced post operative pain.



METHODOLOGY

The study was a prospective study, conducted at Govt Stanley Medical College, during the year 2021-2022. 17 cases of delayed union of fractures were treated with Bone Marrow Aspirate Concentrate (BMAC) injection.

The patients were kept in supine position, parts painted and draped. The donor site was marked 2cm superolateral to the Anterior Superior Iliac Spine (ASIS), using 14 gauge Sahli's needle, 60 ml of bone marrow aspirated from anterior iliac crest in heparinized containers (1000 IU per 10 ml of Bone marrow) and concentrated by centrifuging at 3500 RPM for 15 minutes. The lower 1/3rd plasma, buffy coat and few RBCs were aspirated and kept in a separate container. 6 ml of BMAC prepared from 60 ml of bone marrow.

As a result the amount of substance needed to be injected was reduced and targeted therapy was possible without reduction of efficacy.



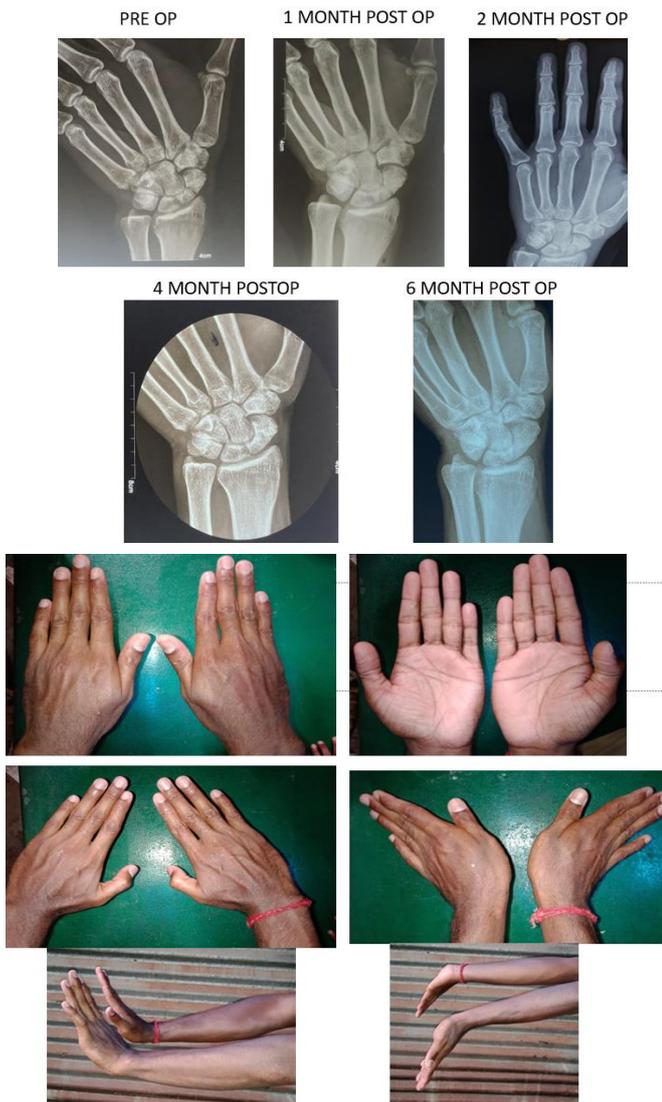
Case Sample 1

A 22 year old male with history of trauma and was diagnosed to have fracture of his scaphoid which was managed conservatively earlier. Pt presented with chronic pain of his wrist and difficulty in day to day tasks. Computer tomography and radiographs revealed that there was a delayed union of the scaphoid fracture. Pt was treated with a single dose of BMAC

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injection. Radiologically evidence of union started to be visible from 2 months post injection. Complete union was achieved by 4 months post injection.



RESULTS

Out of 17 cases of delayed union, fracture union was achieved in 14 cases (82 %).

CONCLUSION

Percutaneous autogenous Bone Marrow Aspirate Concentrate (BMAC) injection is an effective treatment modality in delayed union. BMAC helps to reduce the amount of bone marrow aspirated, reduced post operative pain, reduced intra operative time, reduced requirement of anaesthesia and repeat injections.

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