

## Histological Evidences after Platelet-Rich-Plasma and Adipose Drived Stem Cells Injection on Critical Size Cleft Palate

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### Background

Cleft palate (CP) is a common congenital defect. It makes serious difficulties for cleft-affected children. The gold standard of care is autogenous bone grafting which may cause additional problems in donor site along with disappointing results. Tissue engineering is a promising solution for a widespread range of defects and disorders. It is reasonable to utilize this novel technology for CP management. Stem cells and growth factors play essential role in tissue engineering. Adipose tissue contains a population of stem cells that can be isolated and differentiated into various cell lines, including osteoblasts. In this study, the authors used human Adipose-derived stem cells(hADSCs) and osteogenically differentiated hADSCs along with platelet rich plasma(PRP), a source of growth factors, to repair rat palatal bone defects.

**Materials and Method:** Palatal bone defects were surgically made in 56 female rats. Animals divided into 7 groups (n=8). Human adipose-derived stem cells were collected and incubated with Bromodeoxyuridine (BrdU) in order to labeling. The same was done to osteogenically differentiated hADSCs. Afterwards, the labeled cells were mixed either with PRP or Aminoplasmal and injected to the defect borders. Immunohistochemistry and morphometry analysis were performed 4weeks later.

**Results:** Data showed a significant difference in cleft size between cell-injected and control groups while the cleft site fills with connective tissue rather than osseous tissue. Moreover, immunohistochemistry findings proved the presences of labeled cells in surrounding tissue. There is no significant difference between undifferentiated and osteogenically differentiated cells both in numerical area density of cells and defect size.

**Conclusion:** This study revealed the feasibility of stem cell and PRP application according to CP reconstruction. Further investigation toward clinical application of tissue engineering in CP may eliminate bone harvesting and its negative consequences.

**Keywords:** Adipose Derived Stem Cells, Cell Therapy, Cleft Palate, Platelet-Rich-Plasma.

### Poster Presentation

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