

## Improvement of Vocal Fold Wound Healing by Bone Marrow-Derived Stem Cells in Xenograft Animal Model

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### Introduction

Vocal fold scarring can be caused by trauma, inflammation, or surgery and commonly result in severe dysphonia. Cell based therapies to minimize scarring and enhance healing have been growing interest. This study was aimed to investigate the effect of bone-marrow derived stem cells (BMSCs) for prevention of vocal fold scarring by the use of xenograft animal model.

### Methods

Vocal fold scarring was induced in New Zealand white rabbits by a direct injury. BMSCs were isolated from bone marrow aspirates of GFP transgenic mice and were injected into the vocal folds of rabbits immediately after scarring. PBS was injected into the vocal folds in the same manner for the sham group. Endoscopic, histologic, and biomechanical evaluations of vocal folds were performed after 2 months of the injection.

### Results

The BMSCs-treated vocal folds showed decreased collagen bundles compared to the sham group and the relative hyaluronic acid content in BMSCs-treated vocal folds was higher than the sham group. The BMSCs reduced expression of type I collagen. The mean dynamic viscosity in the BMSCs was improved compared to the sham group. A large number of the injected BMSCs were detected in the vocal folds of rabbits at 2 months after injection.

### Conclusion

This study suggests that the BMSCs could prevent the scarring-induced dysphonia and be developed as a cell-based therapy for vocal folds regeneration. This xenograft animal model also might be a useful tool for research of vocal fold regeneration.