

Post Trigeminal Allograft

Repair MRN Analysis

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INTRODUCTION

- Magnetic Resonance Neurography (MRN) provides strong correlations with surgical findings (PCC= 0.81, K=0.74) for all Sunderland classifications when performed in the post-injury/pre-repair phase in peripheral trigeminal nerve injuries (inferior alveolar [IAN] and lingual nerves [LN])
- 3D, T2-weighted spectral adiabatic inversion recovery (SPAIR) imaging, isotopic 3D PSIF (0.9mm voxel), 3D inversion recovery turbo spin echo (3DIR TSE) and axial diffusion tensor imaging (DTI) demonstrates accuracy of IAN and LN injury classification with T2SIR (ROC =0.84) and thickness (ROC=0.99), accuracy=84%, sensitivity = 93%, and specificity=100%
- From 60 patients who underwent MRN for traumatic peripheral trigeminal nerve injuries who underwent surgical repairs with allografts underwent post-repair MRN for 3 condition and concerns
 - Recurrent pain
 - Failure to progress
 - Spreading numbness and pain

METHODS

- 60 patients
 - 19 males, 41 females
 - Mean age- 41; range – 12 to 75
 - 40 IAN, 20 LN
 - Most common injury etiology= third molar surgery
 - Duration of injury= 152 ± 160 days
 - Classification (at surgery) = I (0%); II (19%); III (27%); IV (35%); V (19%)
 - Allografts = 1.5 x 2.0 cm in length and 2 x 4 mm in diameter
- 4 patients – post-repair MRN
 - 1 male, 3 females
 - Mean age – 30.5; range- 22 to 52
 - 2 IAN, 2LN
 - Allografts = 2 to 4mm x 15mm with CAR
 - Post-repair condition
 - Failure to progress = 3 (1 IAN – **Figure 1**, 2 LN)
 - Recurrent pain = 2 (2LN)
 - Spreading numbness and pain = 1 (IAN)Z

Figure 1

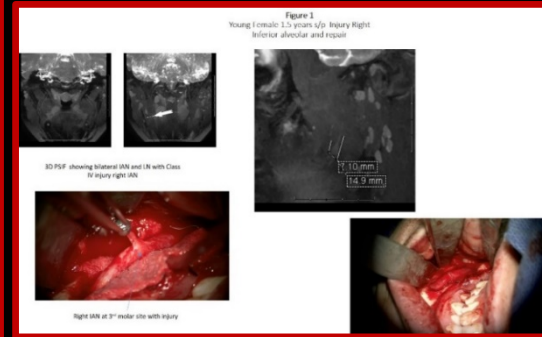


Figure 2



RESULTS

Mean time for post-repair phase MRN
7.75 months
Range = 4 to 17 months

Mean time of post-repair phase MRN per condition
Failure to progress = 4, 4 and 6 months
Recurrent pain = 6 and 17 months
Spreading numbness and pain = 4 months

MRN results

3d PSIF

Complete regeneration and allograft intact = 2 (recurrent pain in LN and spreading numbness and pain in IAN)
Incomplete regeneration and allograft intact = 1 (failure to progress in IAN)
No regeneration and recurrent neuroma = 1 (recurrent pain and failure to progress in LN)

DTI

Complete regeneration and allograft intact
Incomplete regeneration and allograft intact (**Figure 2**)
Haphazard sprouting
Anisotropy present
Double – back?
Reduced volume

CONCLUSION:

- Characteristics of incomplete regeneration
 - Haphazard sprouting
 - Anisotropy
 - Reduced volume

- Post-repair MRN (DTI and 3D PSIF) provide information
 - Status of allograft
 - Regeneration (complete or incomplete) through allograft
 - Failure to regenerate and/or neuroma reformation