Background
- For patients who require orthognathic surgery, removal of third molars is often undertaken beforehand. Facial soft tissue swelling is a cause of concern to patients and it is difficult to convey to convey what size this may be post-operatively with orthognathic surgery compared to that with third molar surgery (TMS).

Objective
- To assess volumetric ST (soft tissue) swelling following third molar surgery and orthognathic surgery versus their respective controls.

Design and setting
- A prospective controlled cross-sectional study carried out from January 2010 until May 2012 at the Cork University Dental School and Hospital.

Materials and Methods
- Following ethical approval 20 patients were recruited for each surgical group. Based on a previous study, a sample of twelve subjects per surgical group would be sufficient to detect a statistically significant result (p<0.05).
- In the TMS group, 4 third molars were surgically removed.
- The orthognathic surgery cohort included the bimaxillary osteotomy group (BMO) and the single-jaw osteotomy group (either mandibular advancement (MAO) or mandibular setback (MSO)).
- Age- and sex-matched control groups had neither surgical procedure.
- Immediately prior to and one week after surgery, 3D (3 dimensional) images of each subject were captured at rest using stereophotogrammetry (di3D®, Dimensional Imaging Ltd).
- Data were statistically analysed using SAS® (Version 9.2). Volume differences were analysed using Analysis of Covariance models (ANCOVA) after natural logarithmic transformation. Pairwise comparisons were performed between the surgical groups with adjustments for multiple comparisons using a variation of the Bonferroni correction.

Results
- There were no significant age or gender differences between the surgical groups or their controls (p=0.37 and p=0.71 respectively). Mean ST volumetric changes were 47.0 cm³ for MAO, 44.9 cm³ for BMO and 22.2 cm³ for MSO; all changes differed significantly from TMS (8.5 cm³); p<0.0001.
- There were statistically significant soft-tissue volumetric differences between each orthognathic sub-group (MAO, BMO and MSO) and the TMS group; p<0.0001.

Conclusions
Compared to subjects who had TMS, approximately five to six times greater ST volumetric swelling was experienced by those who had BMO or MAO and approximately three times greater ST volumetric swelling was experienced by those who had MSO.

References