**Biomechanical Study of Biodegradable Screw Fixation in Maxillofacial Distraction Osteogenesis**

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**INTRODUCTION:** Distraction osteogenesis using internal distraction devices is commonly used to treat patients with congenital micrognathia. One main disadvantage of this treatment is the requirement for device and screw removal after a consolidation period. The conventional internal distraction devices utilize titanium screws for fixation. The removal of titanium screws can pose a challenge in some instances and may require the use of transbuccal approach with a trocar system.

Biodegradable poly-L-lactide (PLLA) materials have been used for maxillofacial osteosynthesis in pediatric patient population. These materials do not need to be removed and are strong enough to provide bony fixation. Previous in vivo studies have found that the average force produced by mandibular distraction is 35.6N, with the maximal force reaching 69.4N.¹ We hypothesize that PLLA screws are strong enough to support the compressive force encountered during active mandibular distraction.

**METHODS:** Ten mandibles are obtained from five canine cadavers. The paired mandibles from the same cadaver were fixated to a mandibular distractor using either eight titanium screws or eight PLLA screws (KLS Martin, Tuttlingen, Germany) (Fig.1). The distractors were each set to 15 mm and 30 mm of distraction distance. The machine subsequently generates an 80N of compression force parallel to the axis of the distraction device. The displacement is measured to examine any mechanical failure during this pre-set load. Finally, if no failure is observed at 80N, a load-to-failure compression test is done in the PLLA group to examine the mechanical failure point of the devices.

**RESULTS:** All the distractors in the titanium screw group and PLLA screw group are able to withstand the 80N compression force without sign of failure at both 15 mm and 30 mm of distraction. When load-to-failure test is performed in the PLLA group, the average device failure point is observed at 172.8 N (range 148 N–196 N) (Fig. 2). After reviewing the high-speed video footage, it is found that all of the failures occurred due to the PLLA screws breaking or falling out of the screw hole.

**CONCLUSIONS:** Bioabsorbable PLLA screws can withstand compressive forces more than double that of the maximal in vivo forces needed during mandibular distraction. These screws may be used as an acceptable alternative for fixation of internal mandibular distractors.

**REFERENCE:**
1. Robinson RC, O’Neal PJ, Robinson, GH. Mandibular distraction force: laboratory data and clinical correlation. *J Oral Maxillofac Surg* 59:539–544, 2001

**National Trends in Deep Venous Thrombosis and Pulmonary Embolism in the Adult Craniofacial Population**

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**BACKGROUND & PURPOSE:** Deep vein thrombosis (DVT) and pulmonary embolism (PE) have been identified as major complications in the plastic surgery patient population, specifically the body contouring subpopulation. There is a paucity of evidence about the incidence of DVT and PE complications in the craniofacial subpopulation. The purpose of this study was to investigate the incidence and risk factors for DVT/PE in the adult craniofacial population.

**METHODS:** Patients included were identified from the 2016 and 2017 Healthcare Cost and Utilization Project National Inpatient Sample based on the diagnosis of a facial fracture on initial encounter. International Classification of Disease codes were used to identify patients with DVT and PE. Two cohorts were identified: adult craniofacial trauma patients with a DVT and/or PE diagnosis and patients without a DVT and/or PE diagnosis. The cohorts were analyzed to determine risk factors for developing a DVT/PE during an inpatient admission.