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Temporomandibular Joint Total Joint Replacement and Metal Hypersensitivity

The need for Temporomandibular Joint total joint replacement (TMJR) is growing with almost 12500 procedures anticipated by 2030. The outcomes following TMJR have been reported with significant improvement in pain, function, and quality of life for the majority of patients. Multiple comorbid factors are known to influence outcome including anxiety, depression, somatization, central sensitization, neuropathic pain, specific genetic polymorphisms, and an increasing number of prior joint procedures. Furthermore, patients can be divided into one of three clusters (Adaptive, Pain Sensitive and Global Symptoms) based on several psychosocial factors. The Global Symptoms cluster tends to report wide spread pain and are considered to be poor surgical candidates. In addition to comorbid conditions, the potential for metal hypersensitivity to result in persistent pain, localized swelling and pruritus, systemic contact dermatitis and prosthesis failure exists. These have all been documented following total knee and hip replacements particularly with metal on metal devices.

The researchers will determine whether metal hypersensitivity develops following TMJR and what is the clinical significance of such a finding. Furthermore the researchers will look to see if metal hypersensitivity correlates with pain and patient reported outcome measures (PROMs) including the Jaw Function Limitation Scale (JFLS-8) and the Oral Health Impact Profile (OHIP-TMD). In order to identify comorbid conditions that may be associated with patient outcomes the Basic Symptom Inventory (BSI-18) and Pressure Pain Threshold (PPT) will be used preoperatively.

Metal Ion serum levels and the Leukocyte Transformation Test (LTT) will be measured preoperatively (T0) and again at 12 months (T3). In addition to a complete medical and social history, patients will complete the BSI-18 and PPT preoperatively (T0). Serial clinical examinations will be performed preoperatively (T0), 6 weeks (T1), 3 months, (T2) and at 12 months (T3) to record pain scores, function (maximum incisal opening) and patient reported outcomes (JFLS and OHIP-TMD).

This prospective multicenter cohort study represents the first study in oral and maxillofacial surgery or orthopedics that will measure metal hypersensitivity before and after joint replacement and correlate it's potential development with validated PROMS. The identification of patient clusters will also provide robust data regarding the association between patient outcomes and comorbid conditions including anxiety, depression, somatization, and widespread pain sensitivity.

It is anticipated that this project will provide strong data regarding outcomes following TMJR (for all patients having TMJR) as well as helping identify comorbid conditions that may predict poor outcomes following TMJR and potentially other pain driven TMJ surgical procedures.