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## IMMEDIATELY LOADED IMPLANTS IN A PATIENT WITH INVOLUNTARY MANDIBULAR MOVEMENTS: A CLINICAL REPORT

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Immediately loaded implant prostheses have been used to successfully rehabilitate completely edentulous arches. Risk factors for successful treatment have not included involuntary mandibular movements. The treatment was completed on a patient with a history of neuroleptic medications who had remaining mandibular teeth extracted and then developed involuntary mandibular movements. The patient was dissatisfied with a mandibular removable prosthesis and wanted a fixed prosthesis. The immediate implant loading of a complete arch fixed prosthesis was delivered, and the patient lost 3 of the 6 implants. The patient continued to have problems with her definitive prostheses as the symptoms of her involuntary mandibular movements worsened. (*J Prosthet Dent* 2013;■:■-■)

The immediate occlusal load of implants in the edentulous mandible with a fixed prosthesis has become a predictable treatment with reduced discomfort, postoperative adjustments, and treatment time compared to traditional treatment protocols.<sup>1-3</sup> Patients are often highly satisfied with a fixed immediate prosthesis in the mandible.<sup>4</sup> The success has been well documented and has been shown to be influenced by bone volume and the initial stability of the implants.<sup>1-3,5,6</sup> Clinical studies on immediate and early loading have shown the survival rates of implants in the mandible to range between 90% and 100%.<sup>1-3,7</sup>

Selecting edentulous patients for an immediate occlusal load prosthesis should include careful consideration of risk factors.<sup>8,9</sup> Patients whose medical histories include diabetes, heavy smoking habits, a history of therapeutic radiation to the head or neck, metabolic disease, a history of drug/alcohol abuse, or current treatment with chemotherapy or steroids are generally considered at high risk with immediate load protocols.<sup>10</sup> Patients whose dental histories

include active heavy bruxism, an arch opposing natural dentition, poor bone density, and poor oral hygiene have shown an increased incidence of complications and/or implant failure.<sup>8,10,11</sup>

One possible risk factor for immediate implant success that has not previously been considered is involuntary movements of the orofacial structures, often referred to under the generic term dyskinesia.<sup>12</sup> Dyskinesia can include involuntary movements of the face, mandible, and tongue.<sup>13</sup> Examples of nonfunctional involuntary movements include lip smacking, protrusion of the tongue, and repetitive elliptical mandibular movement patterns. The primary etiology of these movement patterns is a history of neuroleptic medications, which are dopamine receptor antagonists.<sup>14</sup> Predicting which patients will be at risk for developing involuntary mandibular movements can be difficult. The onset of symptoms is often not apparent until at least 5 months after beginning neuroleptic medications, and over 71% of patients report continuing symptoms after discontinuing them.<sup>15</sup>

The extraction of remaining dentition has also been reported to be associated with an increased prevalence of irregular mandibular movements.<sup>16</sup> In a study evaluating 75 patients, the prevalence of dyskinesia in edentulous patients was significantly higher (16%) compared to those who were dentate (0%).<sup>16,17</sup> However, other reports have not shown this association.<sup>18</sup>

Unfortunately, edentulous patients with involuntary movement disorders are difficult to diagnose and treat, and few guidelines exist for prosthodontic management.<sup>14,16,18,19</sup> In one of the few studies of implants in patients with neurologic disabilities, there was an 86% success rate of conventional 2-stage implant loading, and the authors attributed the failures to oral habits such as excessive tongue movements.<sup>20</sup> A Medline search of oral movement disorders and immediate loading of dental implants revealed no clinical studies or reports.

This clinical report describes the complications encountered when a patient with involuntary mandibular movements was treated with immediately loaded implants.

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## CLINICAL REPORT

A 79-year-old woman sought care for discomfort in the lower left jaw and difficulty wearing her mandibular partial dental prosthesis (Fig. 1A). A review of the patient's medical history revealed hypertension, osteoporosis, a history of facial trauma, depression, and a gastrointestinal disorder. Her medication for the gastrointestinal disorder was 10 mg of metoclopramide (Reglan), a neuroleptic medication. Clinical (Fig. 1B) and radiographic examination (Fig. 2) revealed a maxillary dentition with a failing fixed dental prostheses from the maxillary right second premolar to left first molar. The mandibular left premolars presented with perforated crowns and class II mobility. The mandibular teeth had severe attrition. An intraoral examination revealed normal mucosa and saliva flow. The patient

exhibited poor abutment teeth, an uneven occlusal plane, and an occluding vertical dimension at a reduced inter-arch distance.

The patient stated a strong preference for the treatment to include a fixed prosthesis in both the mandibular and maxillary arch. Of significance was a self-reported history of bruxism but no involuntary mandibular movements. In the maxillary arch, the existing long-span fixed dental prostheses was removed, nonrestorable teeth extracted, and a fixed interim restoration placed to correct the occlusal plane and evaluate abutment teeth. In the mandibular arch, the remaining teeth were extracted, and an immediate denture prosthesis was delivered. The patient healed uneventfully after the extractions. While the patient was healing, no fracture or significant wear of the provisional was noted. She did not report any

bruxism, but she did report difficulty adapting to the mandibular interim removable prosthesis. Because the patient wanted a fixed prosthesis, an immediate occlusal load implant mandibular prosthesis was discussed, and the risks, benefits, and alternatives were explained.

Six implants (Nobel Biocare) were planned in the mandible by using the Nobel Guide software, and the digital data were sent to Nobel Biocare for the fabrication of a surgical guide and duplicate denture. Before surgery, an autopolymerizing acrylic resin (Cold Pack; Yates Moltoid) screw-retained fixed interim restoration was fabricated. An experienced surgeon placed 6 evenly spaced mandibular implants (Brånemark System Groovy MK III; Nobel Biocare), which were all torqued to 40 Ncm or more. The abutments of the provisional prosthesis were torqued to the recommended 35 Ncm (Fig. 3A). A postoperative panoramic radiograph showed the interim prosthesis seated into the implants without obvious misfit (Fig. 3B).

At the 1-week postoperative appointment, the patient reported discomfort from the tissues adjacent to implants bilaterally, yet clinically, no erythema, edema, or discharge was visible. The pain she described increased over subsequent weeks and was particularly bad when chewing. Six weeks after implant surgery, exudate and swelling began to develop. The interim fixed prosthesis was removed for the first time, and 3 implants were grossly mobile (Fig 4). The implants were removed, the sites were degranulated, and an interim mandibular denture was placed. Several weeks later, the patient fractured the interim mandibular denture at the midline. Her symptoms also included significant cheek biting, difficulty chewing food, and discomfort with her tongue when moving a bolus of food onto the chewing surface.

The patient refused more implants and approved a modified treatment plan for a mandibular implant overdenture reinforced with a cobalt-chromium framework on the remaining



**1** A, Pretreatment facial view. B, Pretreatment intraoral view.



**2** Pretreatment panoramic radiograph.



**3** A, Immediate fixed interim prosthesis. B, Panoramic radiograph at time of interim prosthesis delivery.



**4** Swelling around implants at time of removal of fixed interim prosthesis.

3 implants retained by Locator attachments (Zest Anchor) and for maxillary survey crowns and a maxillary partial removable dental prosthesis. The definitive maxillary partial removable dental prosthesis and mandibular implant overdenture were delivered (Fig. 5). Despite multiple adjustments over a 3-week period, the patient reported difficulty controlling her tongue or mandible, which contributed to problems in speech and chewing. The patient observed that her mandible was shaking more than before the teeth were extracted. Three weeks after the delivery of the definitive restorations, the patient fractured the metal ceramic crown on her maxillary right canine (Fig. 6). No wear on the opposing acrylic resin teeth was noted, but without her mandibular prosthesis, the Locator attachment in the mandibular right canine position contacted the lingual of the maxillary right canine during her involuntary mandibular movements. Recordings of her involuntary movements were made with a video camera (Canon Rebel t3i; Canon). She exhibited an elliptical pattern of the mandibular movement from left to right, with protrusive tongue movement and continuous lip smacking. A consultation with her physician was completed, but because of patient management issues, the physician was unable to change her medications.

## DISCUSSION

The involuntary mandibular movements were not observed by the patient or treating dentists until after the mandibular dentition had been removed, which is consistent with previous reports.<sup>16</sup> The involuntary mandibular movements were of sufficient force to result in the fracture of the porcelain of a recently cemented crown and of the mandibular immediate denture prosthesis and may have contributed to the early failure of 3 of the 6 immediately loaded mandibular implants. Although appropriate primary occlusal stability of all 6 implants was achieved, the patient's irregular mandibular movements generated significant forces that likely



**5** Definitive maxillary removable dental prosthesis and mandibular implant overdenture.



**6** Fractured porcelain on maxillary right canine metal ceramic crown. Opposing acrylic resin denture tooth was unworn.

resulted in micromovement and the failure of the immediately loaded implants. Neuroleptic medications and edentulism may be contributing etiologic factors for forceful, involuntary mandibular movements and should be further investigated as risk factors for the loss of osseointegration in patients with immediately loaded implants. In order to minimize the implant treatment challenges associated with patients who may develop involuntary mandibular movements, early diagnosis, conventional 2-stage implant treatment, and clear communication with the patient about the limitations of prosthodontic treatment are recommended.

## SUMMARY

This clinical report described the treatment of a patient with irregular mandibular movements who presented

unique prosthetic and surgical challenges for immediate implant loading. The risks for implant treatment planning in this patient group must be carefully assessed.

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