

# 4 case reports: dental management of patients with drug induced Tardive Dyskinesia (TD)

## Abstract

The literature is inundated with copious medical interactions and side effects resulting from pharmacotherapeutics. The Center for Disease Control and Prevention (CDC) has alluded to an increase in human lifespan, juxtaposition to the management of accompanying chronic diseases. This report focuses on involuntary movement of structures in the head and neck region that is associated with pharmacologic therapy, and the associated complications of dental management associated with this unique but growing patient population. Inherent in this report is a systematic review of Tardive Dyskinesia in the literature.

**Keywords:** facial pain, involuntary movements, chronic diseases

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**Abbreviations:** CDC, the center for disease control and prevention; TD, tardive dyskinesia; FDA, federal drug administration; IBS, irritable bowel syndrome; GERD, gastro-esophageal reflux disease; PMDD, premenstrual dysphoric disorder; CPAP, continuous positive-airway pressure devices

## Introduction

Tardive Dyskinesia (TD), was first described in 1957 as a neurological syndrome resulting from the long-term use of neuroleptic drugs. These drugs have been prescribed for various disorders including psychiatric, gastrointestinal and neurological. TD symptoms are characterized by repetitive involuntary rapid movements of the arms, legs, fingers and trunk, while the oral-facial components include: grimacing, tongue protrusion, lip smacking, puckering and pursing, and rapid eye blinking. Healthcare professionals are facing an increasingly aging America as the “Baby-Boomers” assume geriatric status. The CDC, states that this geriatric population is expected to experience an increased incidence of chronic diseases requiring medical management.

Society enjoys this increased longevity largely as a result of successful medical management of chronic diseases. Dentists and other healthcare provider’s are now faced with the management of a plethora of complex medical conditions synergistically with multifactorial adverse risks.<sup>1-3</sup> The majority of the Federal Drug Administration (FDA) approved medications are associated with benefit/risk; however unforeseen drug combinations are known to produce serious adverse drug-induced oral manifestations.<sup>1,2-4</sup> Managing, isolating and identifying contributing etiologies responsible for a significant catastrophic neurological alteration in muscular physiological activities found in TD may be a daunting challenge.<sup>5-8</sup> The occurrence of facial neuromuscular dysfunction involves multiple biological factors including: medication, heredity, culture, eating habits, and occupations.<sup>5-8</sup> The literature suggests symptoms of TD may evolve following an initial medication therapy but statistics imply that the prevailing cause is associated with prolong usage of certain classes

of medications. The data also suggest that this disorder may have a greater prevalence in older female patients.<sup>7-13</sup> The purpose of this article is to review the clinical presentations of a cohort of four patients seen in the Urgent Care Clinic at The University of Texas School of Dentistry, Houston, Texas, who self-reported a diagnosis significant for TD. Additionally, we highlight some of the challenges associated with treating these patients and state recommendations for the dental management of this cohort.

## Case I

**CC:** 54 year-old Caucasian American female presented to The University of Texas at Houston School of Dentistry Urgent Care Clinic with a specific chief complaint of facial pain on lower left side.

**Vitals:** BP: 140/90, P: 86, Resp: 21/minute and temperature: 98.8°F.

**Allergies:** Clindamycin and Sumatriptan (Imitrex®).

**Social HX:** - Tobacco, - ETOH, - Recreational drugs.

**Medical HX:** Hypertension, Type II diabetes, Depression, Migraine headaches, Involuntary Masseter muscle movements, Irritable Bowel Syndrome (IBS), Diarrhea, abdominal pain, heart burn, nausea/vomiting, gastro-esophageal reflux disease (GERD), pneumonia, bronchitis and a seasonal cough.

**Medications:** Direct BOTOX injections: masseter muscle for control of involuntary movements, 25 mg of topiramate (Topamax®), 5 mg zolmitriptan (Zomig®), naproxen (Naprosyn®) prescribed by her neurologist for migraine headaches, lansoprazole (Prevacid®) prescribed by her gastroenterologist for GERD, prochlorperazine (Compazine®) prescribed by her gastroenterologist for nausea and diarrhea, 40 mg of fluoxetine HCl (Prozac®) prescribed by her family physician for depression, metformin (Glucophage®) prescribed by her internal medicine physician for Type II diabetes, pregabalin (Lyrica®) prescribed by her neurologist for constant pain, pravastatin (Prevachol®) internal medicine physician for cholesterol, lisinopril prescribed by her internal medicine physician for hypertension,

terbinafine (Lamasil®) prescribed by her family physician for fungus, and fexofenadine/pseudoephedrine (Allegra D) prescribed by her family physician for seasonal allergies.

**Patient examination:** The initial extra oral examination consisted of visual observation of the patient's mannerism, which revealed uncontrolled facial movement, rapid eye movements, body contortions, eccentric mandibular movements, including grinding movements, and arm swimming movements. There was no perceptible trismus, swellings, cracking or popping of the TMJ.

The intra oral examination revealed thick ropy saliva and evidence of xerostomia, soft tissue with buccal mucosal ulcers, gingival soreness, translucent, erythematous, and discolored sore tongue, bright red, beefy and fissured. The hard tissue examination revealed multiple eroded, fractured and non-restorable teeth. We localized her pain to tooth #19 which was showed positive thermal and percussion test.

Radiographic examination revealed a c4-c5 radiolucent lesion on #19 with periapical pathology.

**Diagnosis:** Non-restorable tooth #19.

**Assessment and treatment plan:** Given the multiple oral manifestations of TD, specifically the multiple erratic oral-facial movements; treatment was limited to extraction of tooth #19 under Nitrous Oxide (N<sub>2</sub>O) sedation and local anesthesia. The tooth was extracted utilizing 40% N<sub>2</sub>O and 2 cartridges of 2% lidocaine with epinephrine 1:100,000 without complications, and patient subsequently released with postoperative instructions which included over-the-counter NSAID's for pain. The patient returned in 15 days for a post-operative consultation with a concern regarding a "dry socket." Both clinical and radiographical examination exhibited a normal healing process. The extraction socket was irrigated with chlorhexidine gluconate, and the patient was discharged without any further complications.

## Case II

**CC:** 57 year old non-ambulatory Caucasian American female presented to The University of Texas at Houston School of Dentistry Urgent Care Clinic with a chief complaint of chronic facial pain.

**Vitals:** BP: 130/80, P: 86, respiration rate 21/minute and a temperature of 98.8°F.

**Allergies:** NKDA.

**Social HX:** - Tobacco, - ETOH, - Recreational drugs.

**Medical HX:** Parkinson's disorder (5 years), osteoporosis, hypoparathyroidism, GERD, Depression, Generalized Anxiety Disorder, Seizures and Tardive Dyskinesia (TD).

**Medications:** Ibandronate (Boniva®) 50mg prescribed by her family physician for osteoporosis, Ergocalciferol (Drisdol®) 50,000IU prescribed by her family physician for hypoparathyroidism, Carbidopa/Levidopa (Stalevo) 150mg prescribed by her neurologist for Parkinson's disorder, Cyclobenzaprine (Flexeril®)10mg as a muscle relaxant, Prochlorperazine (Compazine®) prescribed by her family physician for GERD, Hydrocodone/APAP (Vicodin®) 7.5/750mg and Tramadol (Ultram®) HCl 50 for pain management, Escitalopram oxalate (Lexapro®) prescribed by her family physician

for Depression, Generalized anxiety disorder and Zonisamide (Zonegran®)100mg prescribed by her neurologist for partial seizures.

**Patient examination:** The initial extra oral examination consisted of watching the patient enter into the clinic area in a wheelchair; patient exhibited uncontrolled facial movement, rapid eye movements, body contortions, eccentric grinding mandibular movements and arm swinging movements were noted. The patient stated that she was diagnosed for TD one year earlier. The patient stated that her uncoordinated/uncontrolled myo-facial symptoms had worsened over the past 3 months resulting in the loss of several teeth due to periodontal disease and bruxism. There was no perceptible trismus, swellings, cracking or popping of the TMJ. The intra oral examination signs of xerostomia, soft tissue with multiple <2mm ulcerations, and an enlarged erythematous tongue. The hard tissue examination reveals multiple fractured teeth in various stages of decay with presence of heavy calculus on lower anterior teeth with class 2-3 mobility indicating severe periodontal disease due to excessive mandibular movement and grinding.

**Radiographic examination:** Revealed excessive bone loss of lower anterior teeth.

**Diagnosis:** Severe periodontal disease lower anterior teeth.

**Assessment and treatment plan:** The patient's treatment was limited to extractions of the lower premolars and anterior teeth. While the patient's perioral movements were extensive, it was concluded that it would not alter the delivery of care. The teeth were extracted under local anesthesia; 2 cartridges of 2% lidocaine with epinephrine 1:100,000 without complications. The patient was subsequently released with post-operative surgical instructions which included over-the-counter NSAID's for pain. The patient did not return for follow-up.

## Case III

**CC:** 36 year old Caucasian American female presented to The University of Texas Health Science Center at Houston School of Dentistry's Urgent Care Clinic with a chief complaint of facial pain at upper right.

**Vitals:** BP: 102/62 and P: 60.

**Allergies:** NKDA.

**Social HX:** - Tobacco, - ETOH, - Recreational drugs.

**Medical HX:** Premenstrual Dysphoric Disorder (PMDD), Chronic pain syndrome since 2007, Fibromyalgia in 2010 Vitamin D deficiency.

**Medications:** Gabapentin (Neurontin®) 100 mg daily prescribed by her family physician for fibromyalgia and Naproxen® 250 mg daily prescribed by her family physician for management of pain, fluoxetine HCL (Prozac®) 20 mg bid prescribed by her family physician for (PMDD) and Ergocalciferol (Drisdol®)prescribed by her family physician for Vitamin D deficiency.

**Patient examination:** The examination began with an interview with the patient who exhibited uncontrolled facial movement and body contortions during which she was responsive to additional queries.

The patient described intermittent pain on the upper right which waxed/waned until it became constant three weeks earlier, gradually increasing in intensity. As part of a neurological work-up, she was

advised to seek dental evaluation for a possible root canal on one of her upper right teeth.

Extra oral examination revealed there was no trismus, swellings, cracking or popping of the TMJ. The intra oral examination revealed poor oral hygiene with thick ropy saliva and evidence of xerostomia, soft tissue showed marginal gingivitis and plaque.

Hard tissue examination revealed tooth #4 had a carious lesion on the distal with sensitivity to hot and cold stimulus and percussion positive.

**Radiographic examination:** c4 radiolucency distal #4 with no periapical pathology and 1 mm above alveolar bone; radiographic calculus present.

**Diagnosis:** #4 irreversible pulpitis.

**Assessment and treatment plan:** Presented gingival scaling, crown-lengthening, root canal therapy, build-up and crown fabrication or extraction. The patient rejected all treatment offers and sought treatment elsewhere.

## Case IV

**CC:** 69 year old Caucasian American female referred to The University of Texas Health Science Center at Houston School of Dentistry's Urgent Care Clinic, presented with a chief complaint of facial pain, burning mouth and lip syndrome.

**Vitals:** No vitals taken.

**Allergies:** NKDA.

**Social HX:-** Tobacco, - ETOH, - Recreational drugs.

**Medical HX:** Depression, Bipolar disease, Hypothyroidism, Osteopenia, and Severe back pain.

**Medications:** Seroquel® prescribed by her family physician for Bipolar disease, Ativan® and Ambien® prescribed by her family physician for depression, Synthroid® prescribed by her family physician for hypothyroidism, Estrogen supplement prescribed by her family physician for osteoporosis, Ultram® (prn pain) prescribed by her family physician for severe back pain and numerous over the counter medications.

**Radiographic examination:** The extra oral examination revealed there was no trismus, swellings, cracking or popping of the TMJ present. The intra oral examination exhibited peculiar smacking of her lips and protruding of her tongue. There was no infection; her lips and tongue were tender to palpation. The lateral borders of her tongue exhibited hyperkeratosis, presumable resulting from her frictional abrasion against her tongue rolling and protrusion. Both examination by three disciplines; general dentist, oral pathologist and an oral surgeon resulted in the following assessment.

**Assessment and treatment plan:** Referral to her primary care physician and psychiatrist, PCP and Psychiatrist evaluation of medications effect on soft tissues.

## Discussion

Evidence strongly suggests that tardive dyskinesia is an adverse reaction associated with dopaminergic antagonist medications or those used to treat neuropsychiatric disorders. The drug-induced progression of this movement disorder is multifactorial, dependent

on the type and combination of medications, dosage, potency and both the age and gender of the patient. It should be noted that the synergistic sequel of certain diseases and medications are acutely severe in women and in elderly patients.<sup>3,14,15</sup>

Similar histories are presented in this cohort of cases and include: multiple chronic health concerns, multiple medications with complex mechanisms of actions and similarities with respect to chief complaints which were essential in identifying this disorder. The four patients exhibited signs and symptoms that indicate the difficulty associated with treatment. The patients collectively demonstrated uncontrolled movement that worsen over time, tooth loss due to periodontal disease and bruxism, xerostomia, tongue movement and lacerations, tongue protrusion and heavy calculus.

Treatment of patients with TD requires a practical approach in which the limitations of the patient and the progressive nature of the underlying disease process are given serious consideration. The patient in case II highlight the progressive nature of this condition and so treatment should be initiated early while the patient still has cognitive and functional capabilities. For those patients who have diminished ability to communicate effectively, a family member who understands their needs should assist with the process of informed consent. Patients with movement disorders would benefit greatly from using an electric toothbrush along with plaque disclosing solution or tablets. Caregivers should be taught proper brushing and flossing techniques so that they may impart this to the patient. Patients exhibiting xerostomia (as seen in all four cases) should be prescribed salivary substitutes to aid the patient and have fluoride varnish applied at each visit.<sup>16</sup>

In cases where there is rigidity of facial muscles, the patient is usually unable to communicate by way of grimacing or other signs that they are experiencing pain. The clinician should be mindful of this and exercise care, and also look for additional signals such as eye movement or gesticulations.

Adequate suction should be employed throughout all dental procedures as some patients have difficulty swallowing. The use of a rubber dam with a low volume suction placed beneath it is advised, and bite blocks are useful to keep open the patient mouth. The rubber dam also protects the tongue, protects against aspiration and contamination of the restoration. By not inclining the dental chair more than 45o the dentist protects against syncope and aids swallowing.<sup>17-19</sup>

Since stress is implicated in the etiology of movement disorders in general, short appointments should be given to patients and preferably shortly (60-90 min) after they have taken their prescribed medications. The presence of a family member or care-giver in the dental operatory provides comfort and reassurance for the patients by their presence or by holding their hands. Dentist can decrease anxiety in their patients by identifying themselves to the patient, and state what they intend to do before doing it.<sup>20</sup>

All four of our patients experienced bruxism, which is a prominent feature of these diseases. In patients with bruxism, occlusal restorations should be flat, so as to avoid breakage. Where applicable, glass ionomers or resin-modified glass ionomers should be used, because of their fluoride-releasing and dentin bonding properties. Dental appliances do not work well with sleep apnea patients, and these patients should be encouraged to consult their physician for other approaches such as continuous positive-airway pressure devices (CPAP).

Our patient in Case II was prescribed Carbidopa/Levodopa (Stalevo) for Parkinson Disease and we restricted our use of local anesthetic containing 1:100,000 epinephrine, to two cartridges. It is important not to exceed 3 cartridges of local anesthetics, as an interaction between epinephrine and levodopa would result in increased blood pressure and heart rate. Seroquel taken by our patient in case IV also interacts with epinephrine by diminishing its ability to raise blood pressure.

In cases involving movement or behavioral issues, benzodiazepines may be considered as an additional management adjunct treatment for the anxiety, however in these patients it was decided that N<sub>2</sub>O would be of some relief in patient movement.

## Conclusion

Clinical manifestations of tardive dyskinesia are rarely reported in the dental literature, thus recognizing the clinical presentation of TD requires skill and experience. Recognition of TD in a dental patient may influence management and treatment modifications of this condition. More visibility needs to be given to this topic so that practitioners can be adequately informed about management options for this population. As always, caution is advised when treating a vulnerable patient population with extensive medical history juxtaposed to medication known to contribute to this disorder.<sup>11,19</sup> Patients under the age of sixty who have been prescribed multiple medications for three months or more are at greater risk of developing TD. Persons age sixty and older are especially vulnerable, as disease progression depends on the dose and potency of the implicated medications. The Parkinsonian symptoms may disappear within a few weeks after the offending drug is withdrawn. These case reports illustrate circumstances in which the need for an accurate clinical diagnosis, a thorough review of medical histories, and detailed clinical interviews are essential for optimal management of our patients.

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## Conflict of interest

The authors have no declared potential conflicts of financial interest, relationships and or affiliations relevant to the subject matter or materials discussed in the manuscript.

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