

2. Romano CL, Duci C, Romano D, Mazza M, Meani E: Celecoxib *versus* indomethacin in the prevention of heterotopic ossification after total hip arthroplasty. *J Arthroplasty* 2004; 19:14-8
3. Kolbl O, Knelles D, Barthel T, Kraus U, Flentje M, Eulert J: Randomized trial comparing early postoperative irradiation *versus* the use of nonsteroidal antiinflammatory drugs for prevention of heterotopic ossification following prosthetic total hip replacement. *Int J Radiat Oncol Biol Phys* 1997; 39:961-6
4. Pohl F, Seufert J, Lehmann H, Springorum HW, Flentje M, Koebl O: The influence of heterotopic ossification on functional status of hip joint following total hip arthroplasty. *Strahlenther Onkol* 2005; 181:529-33
5. Bartlett CS, Rapuano BE, Lorich DG, Wu T, Anderson RC, Tomin E, Hsu JF, Lane JM, Helfet DL: Early changes in prostaglandins precede bone formation in a rabbit model of heterotopic ossification. *Bone* 2006; 38:322-32

6. Brooker AF, Bowerman JW, Robinson RA, Robinson RA, Riley LH Jr: Ectopic ossification following total hip replacement: Incidence and a method of classification. *J Bone Joint Surg Am* 1973; 55:1629-32
7. Roth A, Fuller J, Fahrman M, Anders J, Sachse A, Sander K, Venbrocks R: Prophylaxis of heterotopic bone formation by radiotherapy: A comparison between pre- and postsurgical activity. *Acta Chir Orthop Traumatol Cech* 2005; 72:38-41
8. Maillard M, Burnier M: Comparative cardiovascular safety of traditional nonsteroidal antiinflammatory drugs. *Expert Opin Drug Saf* 2006; 5:83-94

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Paradoxical Vocal Cord Movement: A Unique Case of Occurrence and Treatment

To the Editor:—Paradoxical vocal cord movement (PVC) is a well-described condition that involves adduction of the vocal cords on inspiration, which in turn causes stridor and respiratory distress.¹⁻³ We report a unique case of severe PVC wherein a patient had severe PVC immediately after treatment of the disease with botulinum toxin type A (Botox) injection of the vocal cords; the PVC was immediately and dramatically successfully treated with a small dose of intravenous sedation without any further life-threatening symptoms.

A 30-yr-old woman was scheduled to undergo direct laryngoscopy and Botox injection to the vocal cords for PVC. Four weeks and 1 week before the procedure, she had been tracheally intubated, mechanically ventilated for 1-2 days, and then extubated. Just before the first tracheal intubation, PVC was diagnosed fiberoptically. The patient also had a medical history notable for anorexia, bulimia, and symptomatic gastroesophageal reflux disease. After the uncomplicated induction of general anesthesia, paralysis with succinylcholine, and tracheal intubation, the true vocal cords were injected with 2.5 U Botox in each thyroarytenoid space. After the 20-min procedure, the patient was fully awake, extubation criteria were met, and the patient was extubated. She was transported to the postanesthesia care unit receiving oxygen by facemask. During transport to the postanesthesia care unit, she reported chest tightness, began having audible stridor, and reported that she was unable to breathe as she forcibly removed her oxygen mask. She had no pain but continued to report chest tightness and inability to breathe and now had loud, disturbing inspira-

tory stridor. She was given 2 mg intravenous midazolam, which resulted in immediate resolution of all of her impressive and concerning symptoms. She remained well oxygenated on room air, remained stable, and was void of stridor until her discharge to home 2 days later.

In summary, we present a unique case of PVC that was treated with Botox, which was quickly followed by an episode of severe stridor, which immediately resolved with intravenous midazolam. The dramatic response to a small amount of sedation highlights the importance of underlying psychogenic responses in some of these patients. The case report highlights the delay that may occur in the action of Botox and severe symptoms that may occur immediately after the procedure.

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References

1. Carding P, Raz Y: Paradoxical vocal cord movement: A rare condition that is likely to be misdiagnosed and mistreated. *Clin Otolaryngol* 2000; 25:241-3
2. Maillard I, Schweizer V, Borcard A, Duscher A, Liaudet L, Schaller MD: Use of botulinum toxin type A to avoid tracheal intubation or tracheostomy in severe paradoxical vocal cord movement. *Chest* 2000; 118:874-7
3. Larsen B, Carusso LJ: Paradoxical vocal cord motion: An often misdiagnosed cause of postoperative stridor. *J Clin Anesth* 2004; 16:230-4

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