

# Delayed Wound Healing Following 1<sup>st</sup> MPJ Surgery Attributed to Hysterectomy

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## Purpose & Literature Review

It is estimated that 11.7% of women between ages 40-44 yo have had a hysterectomy [1]. Indications for this procedure include menorrhagia, fibroids and cancer. Although the ovary produces the hormone estrogen, a hysterectomy with attempted preservation of the ovaries may result in early failure of ovarian function. The source of the premature ovarian failure is unclear but it is believed that surgical removal of the uterus or the initial indications for the hysterectomy itself are possible causes. It is the ovarian failure that results in the reduction in estrogen production [2]. Estrogen plays a primary role in bone metabolism inhibiting osteoclast formation and subsequently, cortical and cancellous bone loss. Vitamin D (Vit D) is often prescribed to post-menopausal women to supplement the colonic absorption of calcium. Clinically, Vit D deficiency caused by reduced estrogen can result in poor bone healing.

This case study details an unusual incident of delayed healing with subsequent non-union of a bunionectomy procedure following surgical hysterectomy. While osteoporosis is a risk following a hysterectomy [3], the phenomena of delayed bone healing secondary to hysterectomy and the effect of utilizing Vitamin D and calcium supplementation to rebalance the offset bone healing potential has not been well explored.

## Methodology

The patient is a 44 year old female who initially presented with a chief complaint of pain in the left 1<sup>st</sup> metatarsal phalangeal joint (MPJ). She has a past medical history of anxiety, anemia, menorrhagia and fibroids in the endometrium. Her twenty two month patient course includes her initial evaluation in office, her subsequent conservative treatment course, her eventual surgery as well as the long course of healing and treatment post-op were documented with periodic labs and radiographic assessments. Following surgery, there remained an area of non-union despite a well reduced, appropriately fixated 1st metatarsal (met) osteotomy of the left foot.

## Financial Disclosure:

There is no financial conflicts of interest to disclose.

## Procedures

In this case study, the initial treatment of the hallux abductovalgus began in April 2015 with injections into the L 1st MPJ using 1cc lidocaine, 1cc Decadron Phosphate, 1cc Kenalog 40. The patient initially had temporary relief with this and the treatment was repeated 3 times over the next several months. However the pain returned and surgery was deemed appropriate. In October 2016, the patient underwent a modified Youngswick bunionectomy on the left foot and was placed partial weight bearing in a CAM boot. It was during this time that the patient also underwent a total hysterectomy (cervix and uterus) with removal of the right ovary. After a six week post-operative period, radiographs of the left foot revealed a delay in healing in the dorsal arm of the osteotomy repair. The patient was given 50,000 units of oral ergocalciferol as well as oral calcium supplements over an 8 week period. Subsequent lab work, CAT scan, and DEXA bone density scan were performed showing the patient had anemia, decreased serum levels of calcium and vitamin D. Despite the abnormal blood tests, her DEXA scan was WNL. Patient continued oral supplements, started on iron infusions, weight bearing as tolerated in CAM boot and began bone stimulation therapy in February 2017. A follow-up radiograph in February 2017 showed improvements to non-union site.



4/29/15



11/18/16



12/28/16



## Results

The patient had initially had a long stent of non-healing with tenderness and mild pain on the L 1st MPJ following the 1st met osteotomy clinically and a non-union had developed as confirmed by radiographs. Following oral supplementation and bone stimulation, radiographs showed that the dorsal arm of the osteotomy had begun to heal while the correction was maintained and the screw fixation remained in appropriate position.

## Discussions

While there is an established relationship between hysterectomy and osteoporosis [4] as well as evidence that oral supplementation of vitamin D and calcium have a significant impact on reducing fractures and instances of osteoporosis [5][6], the effect of delayed bone healing secondary to a hysterectomy is not well documented and even less known is the appropriate treatment course for these particular patients. In addition, some investigators have noted even anemia can contribute to poor bone healing [7]. It is suggested that this case study would lead to further elucidation on early detection and causes of potential post-operative non-union healing due to hysterectomy as well as give guidance to develop multimodal perioperative treatment options to correct deficient Vit D, calcium, and even iron levels for optimal healing. The contribution and interaction of reduced Vit D, calcium, and low hemoglobin levels to poor bone healing require further study.

## Resources

- [1] Centers for Disease Control and Prevention Website, *Key Statistics from the National Survey of Family Growth*, Atlanta, GA: Centers for Disease Control and Prevention 2015. Retrieved on June 23, 2015 from: [http://www.cdc.gov/nsfg/key\\_statistics/h.htm#hysterectomy](http://www.cdc.gov/nsfg/key_statistics/h.htm#hysterectomy).
- [2] Moorman, P. G., Myers, E. R., Schildkraut, J. M., Iversen, E. S., Wang, F., & Warren, N. (2011). Effect of hysterectomy with ovarian preservation on ovarian function. *Obstetrics and gynecology*, 118(6), 1271.
- [3] Percival, M. (1999). Bone health & osteoporosis. *Appl nutr sci rep*, 5(4), 1-5.
- [4] Ereksun, E. A., Martin, D. K., & Ratner, E. S. (2013). Oophorectomy: the debate between ovarian conservation and elective oophorectomy. *Menopause (New York, NY)*, 20(1), 110.
- [5] Tang, B. M., Eslick, G. D., Nowson, C., Smith, C., & Bensoussan, A. (2007). Use of calcium or calcium in combination with vitamin D supplementation to prevent fractures and bone loss in people aged 50 years and older: a meta-analysis. *The Lancet*, 370(9588), 657-666.
- [6] Jackson, R. D., LaCroix, A. Z., Gass, M., Wallace, R. B., Robbins, J., Lewis, C. E., ... & Bonds, D. E. (2006). Calcium plus vitamin D supplementation and the risk of fractures. *New England Journal of Medicine*, 354(7), 669-683.
- [7] Varecka TF, et al. The influence of hemorrhagic anemia on fracture healing. Presented at the 2010 Meeting of the Combined Orthopaedic Associations. Sept. 13-17, 2010. Glasgow