Title:
Opioid Usage after Hallux Valgus Correction Surgery

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Conflicts of Interest:
The authors declare there is no conflict of interest

Introduction:
More than 200,000 surgeries for hallux valgus correction occur annually in the United States. Due to the post-operative pain associated with the procedure, opioids are often prescribed to help manage pain. Given the lack of objective data on opioid use and the difficulty of addressing a patient's post-operative pain, we sought to quantify, through a prospective analysis, patient's narcotic use after hallux valgus surgery. The purpose of our study was to determine the average quantity and type of post-operative opioids consumed after hallux valgus surgery and to assess potential predictive factors for increased opioid consumption.

Methods:
Adult patients undergoing primary hallux valgus surgery were recruited from two foot and ankle fellowship trained orthopedic surgeons at a single institution. At the pre-operative visit, patients were consented and completed a demographical questionnaire. Data was collected from the operative and PACU record, as well as the 2, 6, and 12-week post-operative visits. A statistical analysis was performed to determine the average quantity of opioid and non-opioid pain medication consumed post-operatively, as well as any statistically significant correlations.

Results:
For the 58 subjects who completed treatment and data collection in the PACU, 53 consumed opioids. Initial prescriptions for these patients included Hydrocodone, 39 (73.58%) Oxycodone, 13 (24.52%) and Meperidine, 1 (1.89%). The average number of opioid pills collectively consumed at the two-week and 12-week post-operative visit was 19.99 and 22.52, respectively. At the two-week postoperative visit, only patient BMI showed a statistically significant association with increased opioid use.

Conclusion:
On average, patients consumed 22-24 narcotic pain pills after hallux valgus reconstruction surgery. If a physician prescribed 24 narcotics pills after surgery to patients that are not currently utilizing narcotic pain medication, there is a 95% chance they will not need additional pain medication during the two-week postoperative period.

Images/Tables/Charts:

Patient Demographics				
	Age (yrs)	Height (in)	Weight (lbs)	BMI
Mean	55.96	65.01	169.64	28.17
Std Dev	13.54	3.54	41.20	6.17
Min	18	54	102	19.00
Max	83	74	314	45.50

Table 1

2 Week Postoperative Visit				
	# Opioid Pills Used	MME	# NSAIDS Used	# Tylenol Used
Mean	19.99	107.55	11.71	7.1
Std Dev	2.58	97.67	8.69	10.72
Min	0	0	2	1
Max	66	495	40	39

Table 2

6-week Postoperative Visit				
	# Opioid Pills Used	MME	# NSAIDS Used	# Tylenol Used
Mean	24.41	139.94	22.39	14.85
Std Dev	17.82	116.51	19.26	17.18
Max	0	0	1	1
Min	61	500	74	54

Table 3

12-week Postoperative Visit				
	# Opioid Pills Used	MME	# NSAIDS Used	# Tylenol Used
Mean	22.52	144.52	24.54	31.50
Std Dev	14.11	109.11	34.71	56.30
Max	0	0	1	1
Min	55	500	120	138

Table 4

References:

1. Bergen G, Chen LH, Warner M, Fingerhut LA. Injury in the United States: 2007 chartbook. Hyattsville, MD: National Center for Health Statistics; 2008
2. Bethell J, Neuman MD, Bateman BT, et al. Age and postoperative opioid prescriptions: a population-based cohort study of opioid-naïve adults. Pharmacoepidemiol Drug Saf. 2020;29(4):504-509. doi: 10.1002/pds.4964.

3. Carlesso L, Jafarzadeh R, Stokes A, et al. Is the association of body mass index with opioid use mediated by number of painful joints or depressive symptoms: The multicenter osteoarthritis study. Osteoarthr. Cartil. 2019;27:S255
4. CDC. Wide-ranging online data for epidemiologic research (WONDER). Atlanta, GA: CDC, National Center for Health Statistics; 2015. Available at http://wonder.cdc.gov.
5. Davis GG. Complete republication: National Association of Medical Examiners position paper: recommendations for the investigation, diagnosis, and certification of deaths related to opioid drugs. J Med Toxicol. 2014;10:100–6. doi: 10.1007/s13181-013-0323-x.
6. Davis MA, Lin LA, Liu H, Sites BD. Prescription Opioid Use among Adults with Mental Health Disorders in the United States. J Am Board Fam Med. 2017;30(4):407-417. doi:10.3122/jabfm.2017.04.170112
7. Harris PA, Taylor R, Minor BL, Elliott V, Fernandez M, O'Neal L, et al. REDCap Consortium, **The REDCap consortium: Building an international community of software partners**, *J Biomed Inform. J Biomed Inform. 2019;95:103208. doi:10.1016/j.jbi.2019.103208.*
8. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap) – **A metadata-driven methodology and workflow process for providing translational research informatics support**, *J Biomed Inform. 2009;42(2):377-81. doi:10.1016/j.jbi.2008.08.010*
9. Jones CM, Logan J, Gladden RM, Bohm MK. Vital signs: demographic and substance use trends among heroin users—United States, 2002–2013. MMWR Morb Mortal Wkly Rep. 2015;64(26):719-725.

10. Korwin-Kochanowska K, Potié A, El-Boghdadly K, et al. PROSPECT guideline for hallux valgus repair surgery: a systematic review and procedure-specific postoperative pain management recommendations. Reg Anesth Pain Med. 2020;45(9):702-708. doi:10.1136/rapm-2020-101479
11. Murphy SL, Xu JQ, Kochanek KD. Deaths: final data for 2010. National vital statistics reports. Hyattsville, MD: National Center for Health Statistics; 2013.
12. Paulozzi LJ, Jones C, Mack K, Rudd R. Vital signs: overdoses of prescription opioid pain relievers—United States, 1999–2008. Morb Mortal Wkly Rep 201;60(43):1487-92.
13. Rogero R, Fuchs D, Nicholson K, et al. Postoperative Opioid Consumption in Opioid-Naïve Patients Undergoing Hallux Valgus Correction. Foot & Ankle International. 2019;40(11):1267-1272. doi: 10.1177/1071100719862606.
14. Shah A, Hayes CJ, Martin BC. Factors Influencing Long-Term Opioid Use Among Opioid Naive Patients: An Examination of Initial Prescription Characteristics and Pain Etiologies. J Pain, 2017:18(11):1374-1383. doi:10.1016/j.jpain.2017.06.010
15. Stokes A, Lundberg DJ, Hempstead K, Berry KM, Baker JF, Preston SH. Obesity and Incident Prescription Opioid Use in the U.S., 2000-2015. Am J Prev Med. 2020;58(6):766-775. doi:10.1016/j.amepre.2019.12.018.