Increased Opioid Use in Patients with Ehlers-Danlos Syndrome Before and After Total Hip Arthroplasty

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Disclosures

The authors have no pertinent disclosures related to the content or topic in this presentation

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Objectives

1) Understand the basic pathophysiology of Ehlers-Danlos Syndrome and its complex pain manifestations

2) Learn how Ehlers-Danlos Syndrome may affect total hip arthroplasty outcomes

3) Appreciate how multidisciplinary care may play a critical role in management of patients with Ehlers-Danlos Syndrome
Background: Ehlers-Danlos Syndrome

- Ehlers-Danlos Syndrome (EDS) is a spectrum of disorders encompassing abnormal collagen synthesis\(^1\)
- Incidence of 1 in 5,000\(^2,3\)
- 75% of patients with EDS present with symptoms by 15 years old\(^4\)
- Six subtypes of varying hereditary patterns\(^1\)
- Classically includes: joint hypermobility, skin hyperextensibility, poor wound healing, CV, GI, neurologic manifestations\(^1,5-9\)
- MSK complaints: joint pain, swelling, hyperlaxity $\rightarrow$ joint microtrauma and osteoarthritis (OA)\(^7,10,11\)
- Diagnostic criteria: Beighton Score + clinical\(^6,7\)

Background: EDS and Chronic Pain

- Hypermobile Type most common, chronic pain in 90%\textsuperscript{12}
- Multiple organ system manifestations \(\rightarrow\) difficulty with pain control
- Opioid use challenging given decreased GI motility, postural orthostatic tachycardia, dysautonomia, proprioceptive deficits\textsuperscript{12,13}
- Prolonged opioid \(\rightarrow\) central pain sensitization\textsuperscript{14-16}
- Opioids not indicated for EDS-related chronic MSK pain, reserved for acute exacerbations or refractory pain\textsuperscript{4,17}

Image from: https://pdb101.rcsb.org/motm/4=
Current Literature

EDS and Total Hip Arthroplasty (THA):

• EDS patients undergoing hip arthroscopy for hip pain/instability show persistent femoroacetabular impingement, extreme capsular laxity → earlier indications for THA\textsuperscript{10}
• EDS patients are at increased risk for dislocation and revision\textsuperscript{18,19}

What Remains Unknown:

• Opioid use in patients with EDS undergoing THA pre- and post-operatively
• Effect of opioid use on THA outcomes in the EDS population
Purpose

• Primary: investigate opioid use in patients with EDS undergoing THA

• Secondary: determine post-operative risks associated with opioid use in the EDS population following THA
Methods

Design
- Retrospective review
- PearlDiver Database
- International Classification of Disease, tenth revision codes

Cohort
- 2015-2020
- Patients with EDS
- Ages 45-75
- Primary THA for OA
- Propensity matched population control based on age, sex, obesity

Outcome Variables
- Demographics
- Prior hip arthroscopy
- Dislocation, infection, revision, medical complications
- Opioid prescription (Rx), morphine milliequivalent dosing (mme) at 90 days before, 90 days after, 365 days after THA

Statistics
- Descriptive statistics
- Continuous variables t-tests
- Categorical variables Chi-square tests
- Multivariate analysis
Population

25,688 patients with EDS diagnosis
238 EDS patients underwent THA for OA
Propensity matched control population of 1,244,368

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Results

Patients with EDS were more likely to undergo THA
OR 1.82, p<0.0001

More likely to have previous hip arthroscopy
6.7% vs. 0.6%, OR 12.5, p<0.0001

More likely to use opioids
90 days pre-op: 49.1% vs. 35.0%, OR 1.78, p<0.0001
90 days post-op: 59.7% vs. 40.9%, OR 2.08, p<0.0001

Consumed higher quantity of opioids
90 days pre-op: 1163.6 mme ± 1562.8 vs 731.9 mme ± 1230.7, p<0.0001, Cohen’s d = 0.31
90 days post-op: 900.1 mme ± 1235.9 vs 651.7 mme ± 1150.9, p<0.0001, Cohen’s d = 0.21
Results

Patients with EDS were less likely to be short-term opioid users, more likely to have prolonged opioid course

Short term: 39.1% for EDS patients compared to 60.5% for controls, OR 0.45, p<0.0001
Long term: 50.8% for EDS patients, 31.0% for controls, OR 2.17, p<0.0001

If using opioids pre-operatively, more likely to use opioids post-op

90 days post-op: OR 8.19, CI 4.47-15.02
365 days post-op: OR 4.93, CI 2.84-8.53

If using opioids 90 days post-op, then more likely to dislocate

OR 8.16, CI 1.87-35.66

No difference in revision, infection, medical complications between opioid users and non-opioid users with EDS pre-op or post-op
Discussion

• Higher levels of opioid use among patients with EDS in arthroplasty
• EDS patients are more likely to consume opioids and use greater amounts before and after THA
• EDS patients are less likely to discontinue opioid use post-operatively
• Opioid use associated with increased dislocation risk
Discussion – Pain

• Retrospective study by Song et al.\textsuperscript{20}
  • EDS patients most likely to pursue complimentary/alternative medicine (89.7%) followed by opioid and opioid-like pain medications (88.8%)
  • 40% of patients with EDS report improvement in pain with opioids, 22% report adverse symptoms
  • Most effective treatment was bracing (70%)

• In THA EDS population, high likelihood of persistent opioid use at one year post-op

• Consider engaging pain specialist for long-term pain control
Discussion – Dislocation

• Recent PearlDiver study by Moore, et al. of 365 patients with EDS undergoing THA found:\textsuperscript{18}
  • Significantly higher periprosthetic dislocation at 90-days postop (4.2\% vs 1.7\%, \( p = 0.001 \))
  • At 5-years post-op, 10.3\% with EDS, 3.3\% of matched group
  • EDS with lower revision-free survivorship, 92.7\% implant survival at five years versus 96.1\% matched (\( p = 0.004 \))

• Our study shows heightened dislocation risk associated with opioid use at 90-days postop

• Further study regarding economic impact needed
Limitations

• Retrospective database study
• Coding bias
• Variety of phenotypes within EDS spectrum
• Unable to assess concurrent or alternative analgesic use or other analgesic strategies
• Opioid use estimation based on Rxs
• Possible multifactorial etiology of pain leading to opioid use
Conclusions

Elevated risk of opioid use both pre- and post-op should be taken into account when advising patients with EDS who are considering THA.

Patients who persistently consume opioids post-operatively may be at heightened risk for dislocation.

Recommend counseling regarding opioid use, consideration of a multi-disciplinary approach to discuss alternative analgesic modalities.
Thank You
References


