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Short Communication

Post-operative Pain Relief following Hip Arthroscopy - A Retrospective Analysis

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Abstract

Background: Since Hip arthroscopy is gaining popularity in treating various hip pathologies, ensuring effective post-operative pain management is imperative. Our retrospective study aimed to discern variations in post-operative opioid consumption, pain scores and timing of rescue analgesia following hip arthroscopy, based on the anaesthesia type employed during the procedure. **Methods:** In this retrospective chart review of 73 consecutive hip arthroscopic procedures between January 2019 and March 2023, 61 patients received general anaesthesia (GA) with or without regional blocks and 12 patients received spinal anaesthesia (SA) with or without adjuvants. Primary outcomes measured were cumulative postoperative morphine consumption and time for rescue analgesics. Other secondary parameters reviewed were demographics, American Physical status (ASA) class, chronic pain history, anaesthetic techniques, surgical diagnosis, post-op pain scores, type and dose of analgesic medications prescribed and adverse events. **Results:** Our analysis revealed no significant differences between spinal and GA groups in terms of primary & secondary outcomes. **Conclusion:** Type of anaesthesia does not appear to influence post-operative pain scores and analgesic consumption. Utilizing multimodal analgesia featuring local anaesthetic infiltration as core component seems to offer advantages. A larger, adequately powered, prospective study is warranted considering more surgery-specific & patient-specific outcomes.

Introduction

Hip arthroscopy is gaining popularity in treating various hip pathologies like femoroacetabular impingement, labral tears, loose bodies, and chondral lesions of the acetabulum and femoral head. These procedures are becoming more common, as a 25-fold increase in cases was reported from 2006 to 2013 [1]. Progress in arthroscopic methods and perioperative management has resulted in excellent functional results following standard treatment for these conditions, typically conducted in a day surgery or outpatient environment. Nevertheless, performing bone resections during osteochondroplasty, manipulation of acetabular labrum & capsule, the local soft tissue trauma, and intraarticular procedures cause significant post-operative pain. Hence, effective pain management is vital for optimal care.

The current literature lacks standardized protocols for managing post-operative pain after hip arthroscopy. The most common causes of failure to discharge outpatient surgical patient include inadequate control of postoperative pain, nausea, vomiting, and excessive sedation due to narcotic use [2]. Reducing postoperative pain can decrease narcotic consumption, resulting in less opioid-

related side effects, earlier ambulation, quicker discharge, reduced readmission rate for post-operative pain control, increased patient satisfaction, and increased cost-effectiveness of hip arthroscopy [2].

A comprehensive understanding of the nerve supply to the hip is essential for anaesthesiologists. Anatomically, the anterior part of the hip joint capsule is innervated by articular branches of the femoral nerve, and the anteromedial part is innervated by articular branches of the obturator nerve. Branches of the sciatic nerve provide innervation of the posterior part of the joint, whereas articular branches from the nerve to the quadratus femoris

(a branch of the sacral plexus) appear to innervate the posteromedial part. In addition, articular branches of the superior gluteal nerve, a branch of the sacral plexus, innervate the posterolateral section of the joint capsule [3].

This study aims to outline prevailing analgesic practices within our institute, alongside quantifying the cumulative post-operative morphine usage and timing for administering rescue analgesics. Other secondary parameters reviewed were demographics, American Physical status (ASA) class, chronic pain history, anaesthetic techniques, surgical diagnosis, post-op pain scores, type and dose of analgesic medications prescribed and adverse events. This analysis will further investigate whether there are differences in post-operative pain scores and opioid requirements between spinal and general anesthesia (GA) groups which will help to standardize the institutional protocol.

Methods

After approval from our institutional review board (KCH/MOI/740/28/04/2023), a retrospective chart review of 73 consecutive hip arthroscopic procedures at a single academic center between January 2019 and March 2023 was undertaken. All surgeries were performed by a sole orthopedic surgeon and senior author (T.N) with fellowship training in arthroscopic surgery and sports medicine. All patients who underwent hip arthroscopies under neuraxial or general anesthesia with or without regional blocks were included for analysis. Anesthetic techniques included GA, GA with peripheral nerve block, Spinal anesthesia (SA), SA with or without intrathecal adjuncts like fentanyl, clonidine and morphine by different anesthetic practitioners without following any standardized protocol.

At approximately midpoint of our study period, most anesthetic practitioners shifted to total

intravenous (TIVA) based general anesthetic to fasten the post anesthesia care unit (PACU) turn-over. All patients received 20ml of 0.25% Bupivacaine for arthroscopic portal infiltration. After surgery, all patients were observed in PACU and sent to ward after meeting Modified Aldrete's discharge criteria. Postoperative analgesics prescribed by different anesthesiologists included regular Intravenous (IV) paracetamol, regular IV Non-steroidal anti-inflammatory drugs (Parecoxib or Ketorolac) and IV Tramadol /oral oxycodone pills on request basis.

Demographic data collected included age, sex, ASA class, diagnosis, pre-existing chronic pain history and co-morbidities. The Study collected data on the total post-operative cumulative oral morphine-equivalent dose, the time for first rescue analgesic request, post-operative pain scores (Scale 1-10) at 1, 2, 4, 8- & 24-hour intervals and adverse events. Opioid consumption during post-operative period was measured in terms of Oral Morphine Equivalents using standard conversion tables from http://www.opioidcalculator.co.au.

Data were documented using Microsoft excel, and statistical analysis was done using SPSS for Windows (Version 24.0. Armonk, NY: IBM Corp). Basic descriptive statistics are used to report results. The primary outcome variables which were cumulative oral morphine equivalents and time for rescue analgesics in postoperative period compared between groups using non- parametric test, the Mann-Whitney U test. A p value < 0.05 was determined to be statistically significant.

Results

A total of 73 hip arthroscopy cases performed between January 2019 to March 2023 were included. Sixty-one patients received GA with or without regional blocks (Group-1) and 12 patients received SA with or without adjuvants (Group-2). In GA group (Group 1), six patients received a PENG block (Pericapsular External Nerve group), and one patient received a femoral block. This group comprised of 21 Male and 35 female patients, with Mean age of 39.88+11.05 years respectively. Forty-four patients had an ASA classification of 1 and seventeen belonged to ASA class 2. Six patients had a prior history of chronic pain, and Fifty-five patients had no history of chronic pain. Thirty-two patients underwent left sided surgery, twenty-eight on the right side and one patient was operated on both sides.

In Spinal group (Group 2), seven patients received intrathecal clonidine, fentanyl or morphine as adjuvants. The mean age of the cohort was 42.50+7.46 years with 9 male patients & 3 female patients. One subject had history of pre-existing chronic pain and Eleven patients without prior history of chronic pain. Nine patients were ASA class 1 and Three patients belonged to ASA class 2.

Surgical procedures included labral repair and debridement or reconstruction along with acetabuloplasty as well as femoroplasty. Certain patients underwent supplementary concomitant procedures like chondroplasty, trochanteric bursectomy, and iliopsoas tendon release.

Post-operatively, no significant difference was noted between the pain scores at time intervals at 1, 2, 4, 8 & 24 hours among the two groups. Patients in the GA group received a higher mean morphine-equivalent dose compared to those in the spinal group (13.36 mg vs 8.50 mg; P = 0.179). However, it was statistically insignificant. The spinal group patients requested rescue analgesics earlier (0.33 hr vs 1.16 hr; P=0.186) than the GA group whereas the difference was statistically not significant. Six patients were discharged on the same day and the rest were discharged on the following day. No adverse events were noted in both the groups.

Discussion

Unlike arthroscopic surgery in other joints, procedures of the hip joint may portend more significant pain because of the extensive innervation of the joint as well as the extensive bon resection that can be required as part of the procedure [4]. Several options for post-operative pain control have been described for hip arthroscopy including pre-emptive and post-operative systemic medications, intraarticular or peri-portal injection of local anesthetics and peripheral nerve blocks (PNB), such as lumbar plexus block, fascia iliaca block, femoral nerve block and PENG block [5].

The aim of our retrospective review was to identify the postoperative differences in opioid use, pain scores, and time for rescue analgesic dose after hip arthroscopy in relation to the type of anesthesia used for arthroscopic procedures of the hip. We found no significant differences between spinal and GA groups in terms of these outcomes. Our findings contradict those reported by Turner et al. [6], as their retrospective review comparing GA and neuraxial blocks demonstrated a significant decrease in intraoperative and PACU opioid usage within the neuraxial group. Turner et al also noted prolonged PACU stay times with general anesthesia. In our analysis, we extended the examination of analgesic parameters beyond the PACU stay. We do acknowledge the fact that smaller sample size in the spinal group might have an effect on statistical results especially early pain scores. As there is a growing inclination towards performing hip arthroscopies on an outpatient basis, [7] neuraxial anaesthesia might be less favored due to associated risks, including delayed resolution of sensory and motor block and a small yet troublesome risk of post-dural puncture headache, which could impact same-day discharge [8].

In our series, eight patients (seven patents- PENG block and one patient -femoral block) received PNBs in the GA group. Owing to the smaller number of PNBs in GA group, and inherent heterogeneity in the skill mix of anaesthesia practitioners responsible for administering these nerve blocks, we were unable to identify any significant findings in pain scores associated with nerve blocks. In a recent meta-analysis involving eight randomized controlled trials, Kim et al. demonstrated that PNBs have no clinical advantage when compared with the group that received local infiltration analgesics for post-operative analgesia [9]. Out of small number of PNBs in our review, the majority were PENG blocks. Amato et al in their prospective randomized, placebo-controlled trial demonstrated that addition of PENG block to Intra-articular local injections offered limited benefit to post-operative analgesia [10]. We believe that another possible explanation for the limited benefit of PNBs could be because of the meticulous ports infiltration (LAI) by our surgeon at the conclusion of surgery. Our hypothesis is supported by Garner et al who observed similar findings with LAI compared to nerve blocks [11].

La Porte et al. performed a review and concluded that intraoperative techniques, such as intraarticular injection or local anaesthetic infiltration, in conjunction with pre- and postoperative pain medications, offers an effective multimodal strategy for treating postoperative pain following hip arthroscopy [2]. Similarly, Kunze et al underscored the importance of adjunct analgesia in selected patients and illustrated the role of LAI in reductions of pain & opioid consumption [1].

We acknowledge several limitations in the present study. The study design was retrospective, study population is relatively small, and follow-up parameters did not include nerve block assessments. Additionally, non-collection of surgical duration, surgical techniques (osseous vs non-osseous) and the discretionary use of intraoperative analgesic doses & adjuvants by the attending anesthesiologists contribute to further constraints in our study. Furthermore, post- operative analgesic orders varied considerably between patients. Our data indicate the necessity for a prospective study to facilitate a more definitive analysis.

Conclusions

In conclusion, this analysis has given us an overview of the current anesthetic practice of arthroscopic procedures of the hip. We did not find any difference in post-operative pain scores and opioid requirements between spinal and GA groups. Multimodal analgesia with LAI as core component seems to have a beneficial role without an increased risk of post -operative falls, block related nerve injury, and higher cost of care, especially in the context of growing hip arthroscopy procedures in an outpatient setting. A larger, adequately powered, prospective study is warranted considering more surgery-specific & patient-specific outcomes.

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