

## A Pelvic Osteotomy programme in a stand-alone orthopaedic centre: an early service evaluation

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### Abstract

#### *Aim*

We performed an early service evaluation to establish the feasibility and safety of a pelvic osteotomy programme in a stand-alone orthopaedic unit with remote paediatrician cover.

#### *Methods*

A single centre prospective service analysis was performed for all children who underwent pelvic osteotomy for developmental dysplasia of the hip during the first three months of the programme. Data collected included length of stay, readmission rates, requirement for paediatrician review or transfer and pain management. Descriptive statistics were employed.

#### *Results*

54 patients underwent pelvic osteotomy and 52 had complete data sets. Our patients had minimal post-operative opiate requirements and globally achieved a length of stay of one night with no re-admissions. No patient required paediatrician review or transfer.

#### *Discussion*

Our service evaluation has demonstrated the feasibility and safety of a pelvic osteotomy programme in a stand-alone orthopaedic unit with remote paediatrician cover. The programme has made a substantial contribution to reduction of the national waiting list in its first three months.

### Introduction

Pelvic osteotomy is a painful and complex surgery to correct developmental dysplasia of the hip (DDH). In September 2021 there were over 500 children in Ireland awaiting pelvic osteotomy. At this time the National Orthopaedic Hospital Cappagh (NOHC) commenced a paediatric pelvic osteotomy programme with remote paediatrician cover. Children deemed unlikely to require inpatient paediatrician input or post-operative level three care were suitable. We performed a service evaluation looking at analgesia requirements, length of

stay and rates of readmission and transfer in order to establish the feasibility and safety of a pelvic osteotomy programme in a stand-alone orthopaedic unit.

## Methods

We conducted a single centre prospective service analysis of all children who underwent pelvic osteotomy for DDH during the first three months of the programme.

All children undergoing pelvic osteotomy were included. Children were assessed for suitability for the centre via consultant anaesthesiologist triage of a medical questionnaire with referral to a pre-assessment clinic where necessary. Children two years or older who are unlikely to require inpatient paediatrician input or level three care were deemed appropriate. A remote paediatrician on-call service was established prior to programme commencement with a pathway for transfer to a paediatric centre.

Primary outcome measure was length of hospital stay. Secondary outcomes included time in the recovery room, time to first dose and total doses of oramorph, time to first dose and total doses of diazepam, rate of readmission, paediatrician review and transfer.

Data was collected prospectively by ward nursing staff. Descriptive statistics were employed. GraphPad Prism (GraphPad Software, California, USA) was used for analysis. The Shapiro Wilk test was used to assess normality. Data is presented as medians with interquartile ranges (IQR).

## Results

Fifty-four patients underwent pelvic osteotomy and 52 had complete data sets. The results are summarised in Table 1. The median age and weight were 4 years (IQR 3-5) and 18kg (IQR 14.5-21.5) respectively. The length of stay for all patients was one night. All patients underwent general anaesthesia (GA) with single shot caudal epidural. The median time in the recovery room was 45 minutes (IQR 32-60). All patients were prescribed regular paracetamol and non-steroidal (unless contraindicated). Oramorph and diazepam were prescribed as required. The median time from recovery discharge to first dose of oramorph was 3 hours 30 minutes (IQR 2:12-5:05). The median number of doses of oramorph was one (IQR 0.25-1). 55.8% of patients required a single dose, 17.3% required 2 doses, 1.9% required 3 doses and 25% required none. The median time from recovery discharge to first dose of diazepam was 8 hours 20 minutes (IQR 6:20-9:37). The median number of doses of diazepam was 1 (IQR 1-1). 64.1% of patients required one dose, 12.8% required 2 doses and 23% required none. Two patients were discharged with a prescription for diazepam for two days and two with a script for a non-steroidal. There were no readmissions. No patient required paediatric review or transfer.

**Table 1: Results from service evaluation**

<b>Age (years)</b>	4 (3-5)
<b>Weight (kg)</b>	18 (14.5-21.5)

<b>Length of stay (nights)</b>	1 (1-1)
<b>Caudal</b>	52 (100%)
<b>Time spent in the recovery room (hrs:mins)</b>	45 (32-1:00)
<b>Time to oramorph (hrs:mins)</b>	3:30 (2:12-5:05)
<b>Total number of doses of oramorph</b>	1 (0.25-1)
<b>Time to diazepam (hrs:mins)</b>	8:20 (6:20-9:37)
<b>Total number of doses of diazepam</b>	1 (1-1)
<b>Number of readmissions</b>	0 (0%)
<b>Number of paediatrician reviews or transfer</b>	0 (0%)

Data is presented as median (IQR) or number (percentage).

Kg = kilograms. Hrs:mins = hours:minutes.

## Discussion

The commencement of a pelvic osteotomy programme at NOHC has cleared 10% of the national waiting list in three months. Our patients had minimal post-operative opiate requirements and globally achieved a length of stay of one night with no re-admissions.

All of our patients underwent general anaesthesia with caudal epidural. Caudal epidural has previously been shown to provide effective analgesia for lower limb surgery<sup>1</sup> however its role in pelvic osteotomy is unclear. A previous audit found no difference in post-operative opiate requirements between those that had had a caudal and those that had not.<sup>2</sup> Another study found only a prolonged time to first dose of opiate (2-4 hours longer).<sup>3</sup> We believe that the use of caudal epidural enhances patient comfort and satisfaction.

This service has a robust governance structure in place with a clear referral and transfer pathway to Children's Health Ireland at Temple Street. Our service evaluation has demonstrated the feasibility and safety of a pelvic osteotomy programme in a stand-alone orthopaedic unit with remote paediatrician cover. This programme has the potential to have a major impact on the pelvic osteotomy waiting list. Future plans for the programme include transition to a day-case model of care which has been shown to be safe, feasible and cost-effective.<sup>4</sup>

## Conflicts of interest:

None declared

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