



The Experience of Performing Concurrent Elective Circumcision During Paediatric Laparoscopic Inguinal Hernia Repair

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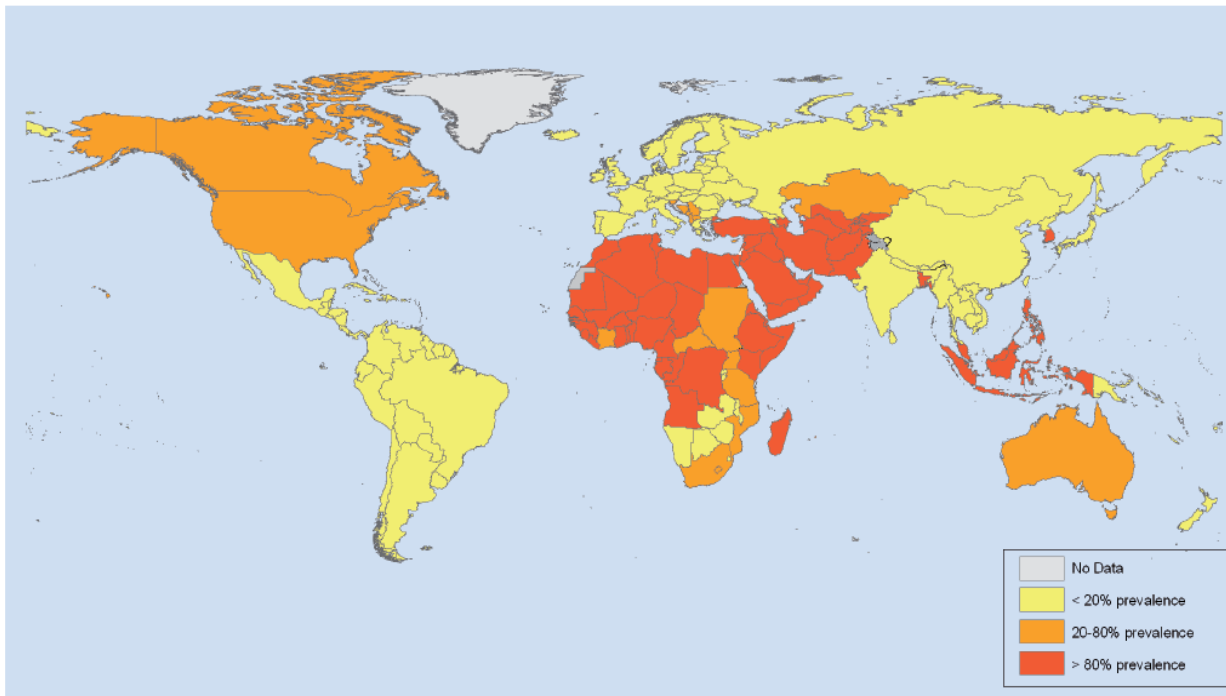
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Research Background

- Indications of circumcision ranging from medical to social, cultural & religious reasons
- By 2016, WHO estimated the global prevalence of 38.7%^{1, 2}

Global Map of Male Circumcision Prevalence at Country Level



- Benefits, reduces risk of:
 - UTI by 23.3% & maximum during infancy³
 - HIV infection^{2, 4}
 - Other sexually transmitted infections e.g HPV, genital herpes & syphilis^{5, 6}
- Generally a safe procedure but associated with complication especially if not done by [trained personnel](#)⁷ or performed in the [community setting](#)⁸

Research Question

What are the effects of **morbidity** & **recovery** on patients who have concurrent elective circumcision (EC) during laparoscopic inguinal hernia (LIH) repair?

Primary Objective

To measure rate of [complication of the abdominal wound](#) associated with concurrent EC during LIH repair

Secondary Objectives

To compare patients who undergone LIH repair with & without EC in terms of:

i. [Morbidity](#)

- Duration of post-operative hospitalization
- Post-operative pain score

ii. [Recovery](#)

- Return to routine activity

Methodology

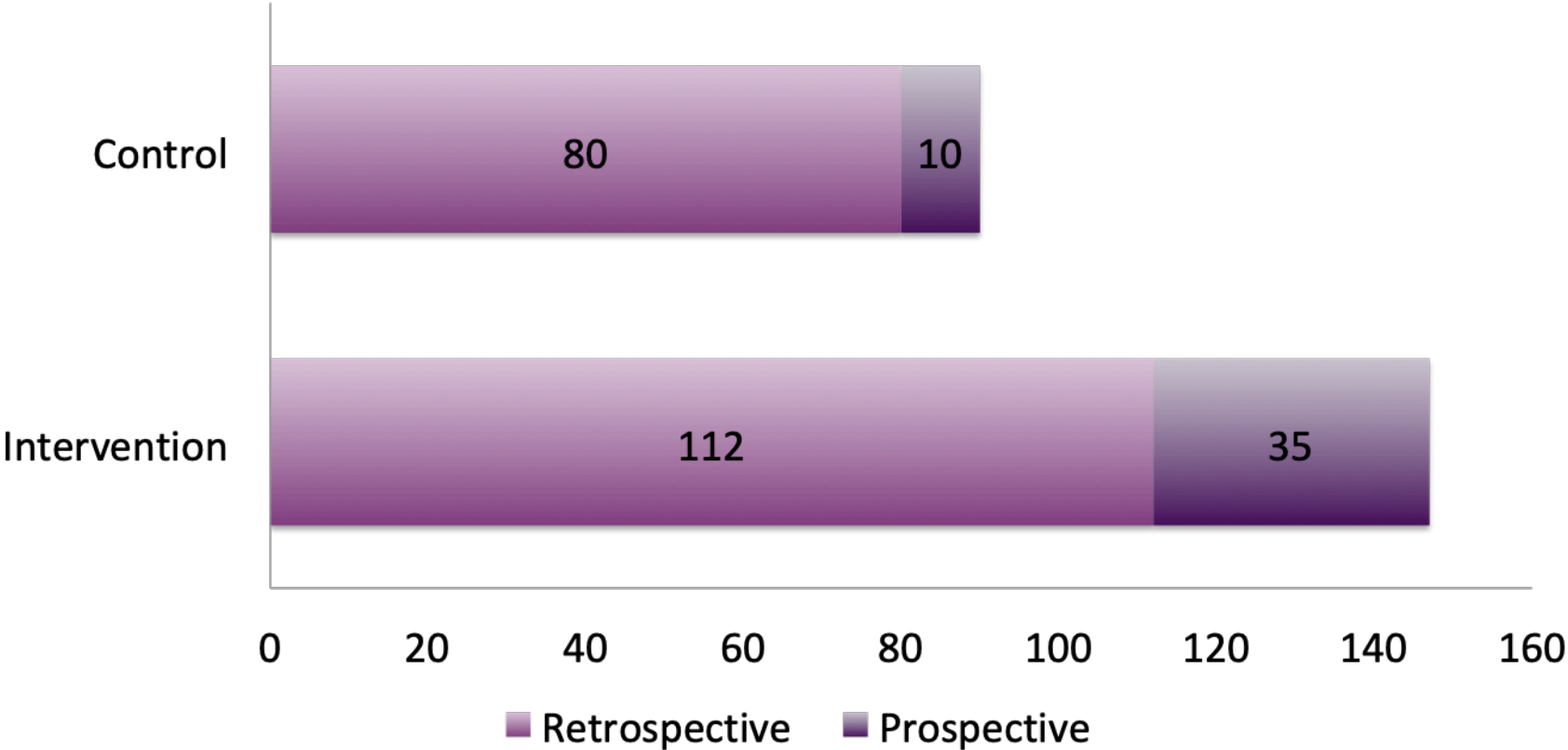
Study Design

- Ambispective cohort study:
 - i. Retrospective, January 2013 – May 2017
 - ii. Prospective, June 2017 – August 2018
- Single centre study in Paediatric Surgery Unit, UKMMC
- Data obtained from:
 - i. UKMMC medical records
 - ii. Interview with parents using Parents' Satisfaction to Paediatric Laparoscopic Surgery⁹ questionnaire

Study population

- Inclusion criteria:
 - Aged 1 month – 12 years
 - Boys with patent processus vaginalis (PPV) & normal penis, underwent LIH repair
- Exclusion criteria:
 - Female
 - Abnormal penis
 - Open herniotomy for any reason
 - Children with special needs
- Grouping:
 - i. **Intervention** = LIH repair + EC
 - ii. **Control** = LIH repair

Graph 1 Number of subjects in both arms according to timeline



Data Sampling & Analysis

- Non-probability sampling
- Time points:
 - i. Post-operative day 1
 - ii. Post-operative day 7
 - iii. Post-operative 30 days
- Data analysis using SPSS[®] version 23
- α (type 1 error) taken at 0.05

Standardization of Surgical Techniques

- i. Laparoscopic inguinal hernia (LIH) repair:
 - 3 abdominal incisions:
 - i. 6 mm supraumbilical camera port
 - ii. 3 mm portless working instruments over right & left lumbar
 - Approximation of pre-peritoneal fascia of internal ring by non-absorbable suture through purse-string method
 - Completeness checked by external squeeze test¹⁰
- ii. Elective circumcision (EC):
 - Circumferential excision of foreskin in layers using bipolar diathermy
 - Skin approximation through simplified sutureless technique using cyanoacrylate skin glue¹¹

Results

Table 1 Demographic characteristics of the study population

	Total (N = 237)	Intervention, LIH repair and circumcision (N = 147)	Control, LIH repair (N = 90)	p-value
Age, n (%)				0.735
1 month – 3 years	207 (87.3)	128 (87.1)	79 (87.8)	
>3 – 7 years	29 (12.2)	18 (12.2)	11 (12.2)	
>7 – 12 years	1 (0.4)	1 (0.7)	-	
Disease, n (%)				0.893
Inguinal hernia	227 (95.8)	141 (95.9)	86 (95.6)	
Hydrocoele	10 (4.2)	6 (4.1)	4 (4.4)	
Side, n (%)				0.173
Right	103 (43.5)	67 (45.6)	36 (40.0)	
Left	46 (19.4)	23 (15.6)	23 (25.6)	
Bilateral	88 (37.1)	57 (38.8)	31 (34.4)	

Table 2 Post-operative complications related to abdominal wound

	Intervention, LIH repair and circumcision (n = 147)	Control, LIH repair (n = 90)	p-value
Post-operative complications, n (%)			0.770
Yes	6 (4)	3 (3.3)	
No	141 (96)	87 (96.7)	
Types of post-operative complications, n (%)			
Major, n (%)			-
Burst abdomen	0 (0)	1 (33.3)	
Minor, n (%)	6 (100)	2 (66.6)	0.721
Bleeding	3	1	
Surgical site infection	1	1	
Haematoma	1	0	
Suture granuloma	1	0	

Relative risk [RR] 1.2

Table 3 Morbidity and recovery outcomes

	Intervention, LIH repair and circumcision (n = 147)	Control, LIH repair (n = 90)	p-value
Duration of post-operative hospitalization in days, median (range)	0 (4)	0 (1)	0.470
Post-operative pain score d1, median (range) ^a	3 (10)	3 (8)	0.590
Post-operative pain score d7, median (range) ^a	0 (5)	0 (0)	0.344
Return to routine activity (days), median (range)	2 (20)	1 (13)	0.212

^aPain score only available for prospective (n = 45)

Discussion

Post-operative complications related to abdominal wound

- 4% from intervention & 3 % from control groups; 1.7% for bleeding, 0.8% for SSI, 0.4% for haematoma development & 0.4% for suture granuloma
- Comparable to previous studies:
 - 2% rate of bleeding from LIH wound from a RCT¹²
 - 1% SSI rate from LIH wound from a systematic review of 22 studies¹³
 - 1.8% SSI & 1.6% suture granuloma over LIH wound from a study of 495 patients with 502 LIH repairs¹⁴
- Glans penis colonized by organisms, non-uropathogenic & uropathogenic¹⁵
- Complication rate including SSI ranges between 0 – 4% from different studies on circumcision^{11, 16, 17}
- Our overall complication over abdominal wound remained low despite addition of RC

Morbidity & recovery outcomes

- Hospital stay
 - Previous studies report stay <24 hours following LIH repair^{18, 19, 12}, a trend found **similar** in our study **despite after addition of EC**
- Post-operative pain score
 - We reported median pain score of 3 from both study groups on day 1, **slightly high** than previous study¹⁹
 - All patients **improved** within 1 week
- Return to routine activity
 - We reported **faster return** to routine activity; 2 days for intervention & 1 day for control
 - A RCT reports return to routine activity at 2.5 days after unilateral LIH repair & 2.4 days after bilateral LIH repair¹²
 - 2.4 days after bilateral LIH repair from another study¹⁹

Limitations

- i. Non-probability sampling
- ii. Recall bias for retrospective data collection involving parents' interview
- iii. Small sample due to single institution involvement

Recommendations

- i. Randomized controlled trial
- ii. Involvement of more patients by extension of study period & multi-centres involvement

Conclusion

- Our results suggested **similar clinical outcomes** for patients with & without addition of EC to primary surgery of LIH repair
- This combination surgery is **safe & feasible**
- Parents of potential patients should be given the option & advised towards this practice whenever feasible

Despite the limitations, our study:

- Produced comparable results on the outcomes of paediatric LIH repair
- Provides a new insight on the practice of concurrent EC
- Can serve as a baseline to guide clinical decision & stimulate further study

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