Pediatric circumcision using n-butyl-cyanoacrylate plus MS monomer: bacteriostatic and cosmetic advantages over suture

S. Strambi, C. Spinelli

Chair of Pediatric Surgery
University of Pisa, Italy

CIRCUMCISION

- Partial or complete removal of the penis foreskin (prepuce)

- 75% of male population of the United States

ADVANTAGES

- Minor risk of urinary tract infections (UTIs) and penile skin inflammation (e.g.balanitis, posthitis and balanoposthitis)

- Partial protection against sexual transmitted infections (STIs), such as HPV, HSV-2 and HIV

Morris BJ et al. BMC Pediatr. 2012

ADVANTAGES

- Decreased risk of invasive penile cancer (as predisponing condition are very uncommon)

Morris BJ et al. ISNR Urol. 2014

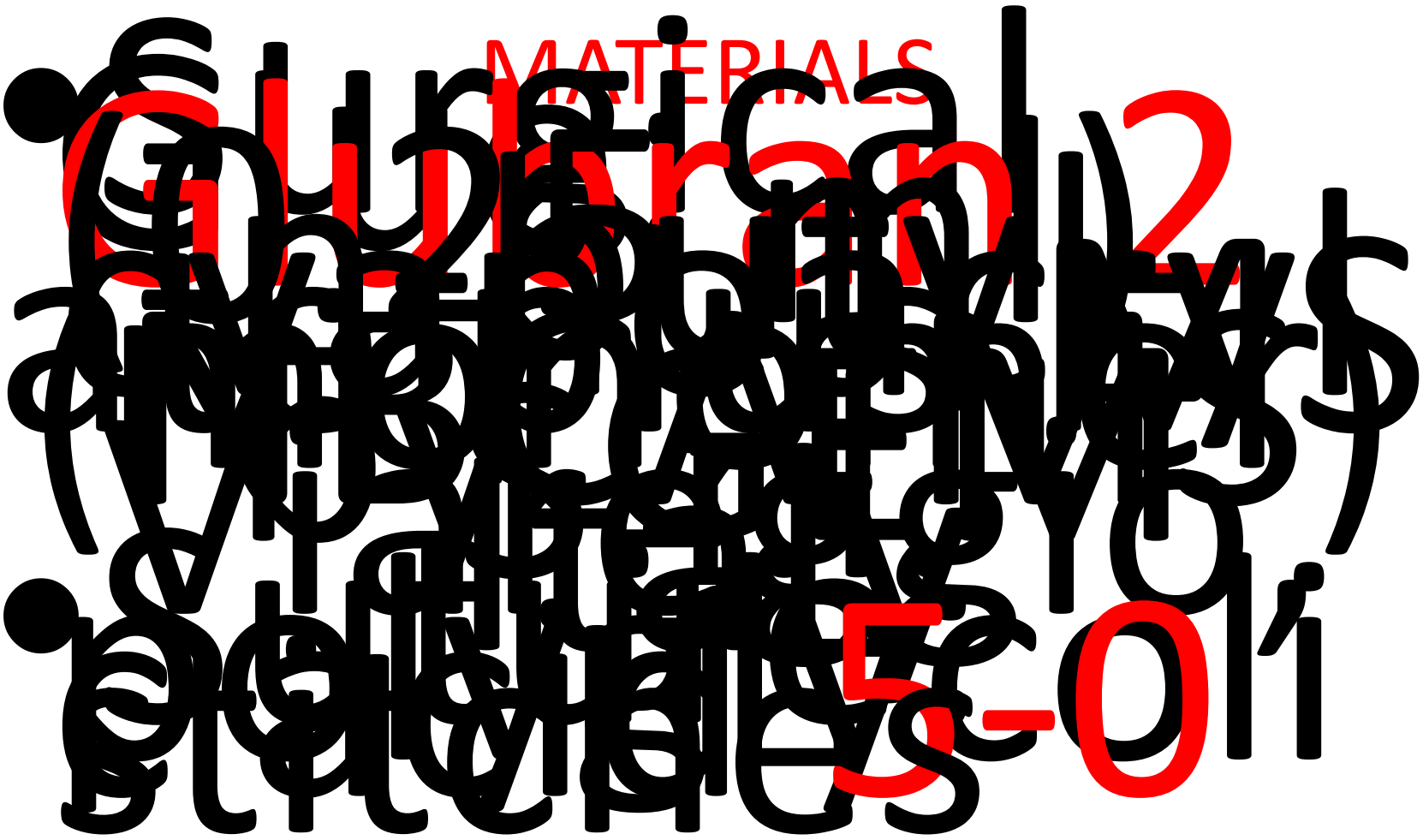
INTRODUCTION

- Different techniques have been described

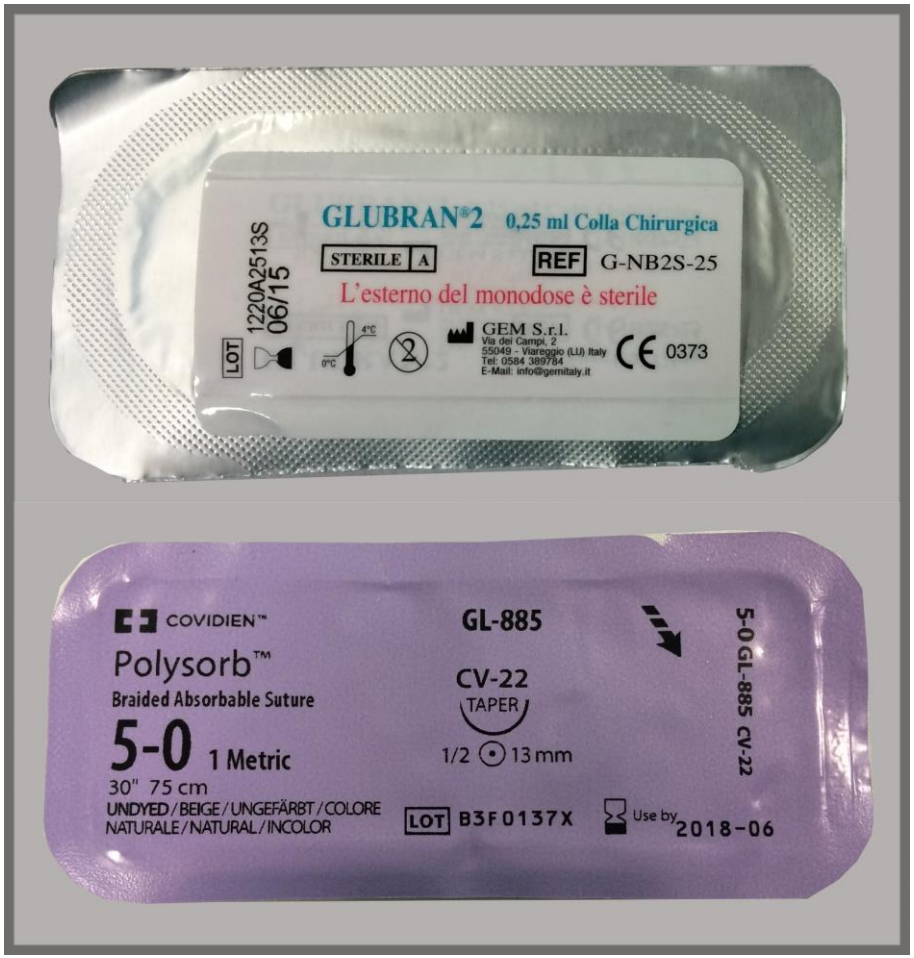
- As adsorbable sutures leave stitch marks along the suture line, the use of glue has been introduced and widely increased

AIM OF STUDY

To test bacteriostatic and cosmetic effects of tissue glue in wound approximation of children circumcision, compared to adsorbable sutures


MATERIALS
Journal
Physics
5-01

MATERIALS


GLUBRAN®2 0,25 ml Colla Chirurgica
STERILE A
REF G-NB2S-25
L'esterno del monodose è sterile
LOT 1220A2513S 06/15
GEM S.r.l.
Via dei Campi, 2
55049 - Viareggio (LU) Italy
Tel: 0584 389784
E-Mail: info@gemitaly.it
CE 0373
COVIDIEN™
Polysorb™
Braided Absorbable Suture
5-0 1 Metric
30" 75 cm
UNDYED / BEIGE / UNGEFÄRBT / COLORE NATURALE / NATURAL / INCOLOR
GL-885
CV-22
TAPER
1/2 13 mm
LOT B3F0137X
Use by 2018-06
5-0 GL-885 CV-22

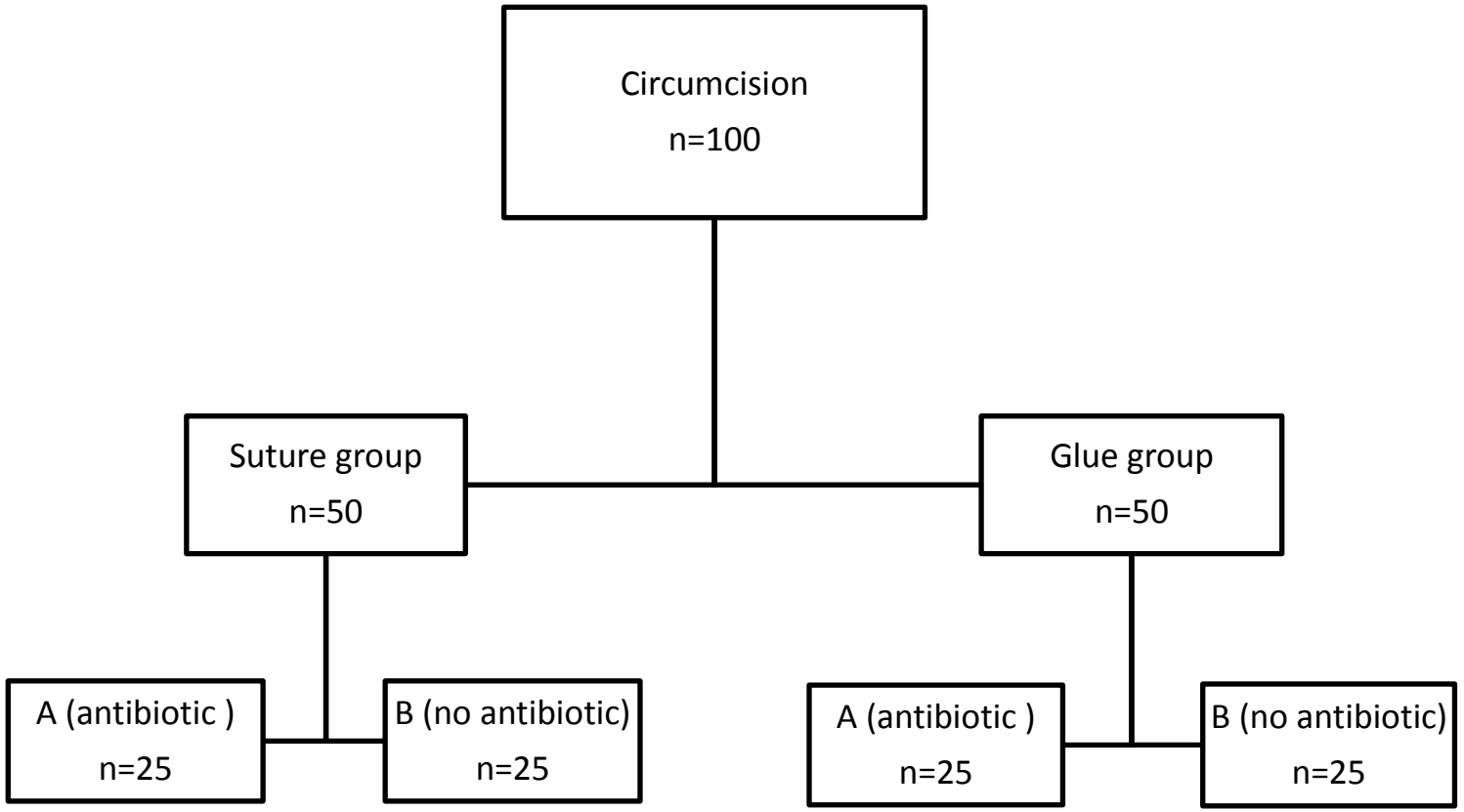
METHODS

Between January 2013 to January 2016

100 boys (range 18 months – 14 years) underwent elective circumcision

73 ethnical/religious reasons
27 phimosis

METHODS


Circumcision
n=100
Suture group
n=50
Glue group
n=50
A (antibiotic)
n=25
B (no antibiotic)
n=25
A (antibiotic)
n=25
B (no antibiotic)
n=25

SURGICAL TECHNIQUE

- The penis foreskin is placed in traction and the skin is incised with the cold-scalpel
- The skin is separated from dartos by round-tip scissors and it is excised with part of the mucosal cuff
- To approximate the wound margins, the frenulum preputii is matched with the raphe penis and the edges are aligned holding the skin together by forceps

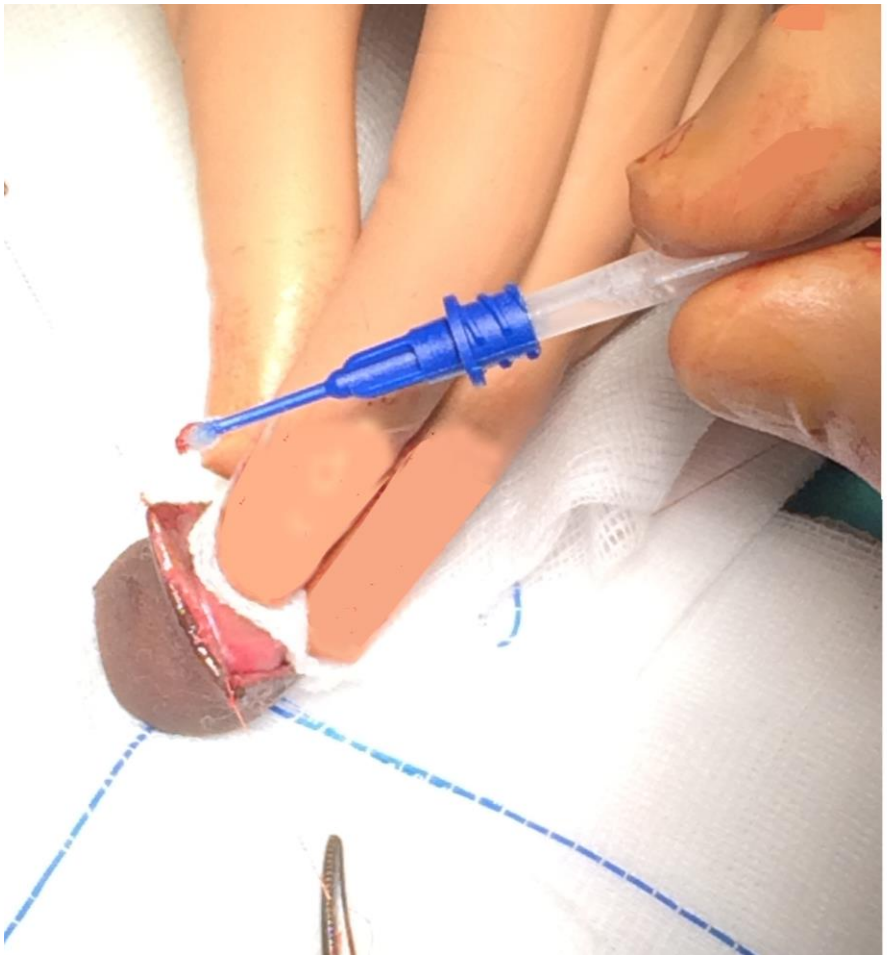
…than the procedure was different in the two groups

In the “suture group”, 4 stitches for each side (approximatively) were employed

…than the procedure was different in the two groups

In the “glue group” we applied Glubran2 protecting glans and urethra with a damp gauze; edges were held together until the glue was dried (about 1’ each)

GLUE AND SUTURE PROCEDURE





METHODS

After surgery, in each group:

- subgroup A received 6 days of *Amoxicillin/clavulanic acid* (45 mg/6,4 mg/kg/day) and *Neomycin sulfate* topical cream (twice a day)

- subgroup B did not receive any post-operative drugs

METHODS

The post-operative pain score has been assessed after 4, 8 and 24 hours, utilizing Children and Infants Postoperative Pain Scale (ChIPPS)

ChIPPS Scale

Item	Score **0**	Score **1**	Score **2**
Crying	None	Moaning	Screaming
Facial expression	Relaxed smiling	Wry mouth	Grimacing
Posture of the trunk	Neutral	Variable	Rear up
Posture of the legs	Neutral	Kicking	Tightened
Motor restlessness	None	Moderate	Restless

0-3 → No requirement for treating pain
4-10 → Progressively greater need for analgesia

Buttner W, Finke W. Paediatr Anaesth, 2000;10:303-318

METHODS

Wound was examined on 7th postoperative day to evidence:

-edema

- signs of infection (local pain, erythema, serous/seropurulent discharge)

METHODS

Scars were evaluated after 30 and 180 days:

-Sufficient

-Good

-Excellent

on VAS for scar evaluation

R Fearmonti et al. Eplasty 2010

RESULTS

Post-operative complication

No patients of both group experienced any post-operative complication (no bleeding, no dehiscence)

RESULTS

Operation time:

significantly higher in the suture group

(20 vs 14 minutes - $P < 0.001$)

RESULTS

Postoperative pain:

less duration and severity in the glue group
(but not significantly different)

RESULTS

Post-operative pain, according to ChIPPS

	After 4 hours			After 8 hours			After 24 hours		
	0	**1**	**2**	**0**	**1**	**2**	**0**	**1**	**2**
Suture group	0	17	33	13	22	15	31	15	4
Glue group	9	29	12	14	29	7	42	8	0
P*	ns			ns			ns		

* for approriate Fisher test, mild and moderate pain columns were joined

RESULTS

Edema (7th day)

7 (14%) cases in suture group

4 (16%) in subgroup A

3 (12%) in subgroup B

RESULTS

Infections (7^{th} day)

5 (10%) serous discharges in suture group,

5 (20%) in subgroup B

RESULTS

Comparison of infection rate between the groups after 7 days.

		Infection	Total
Suture group	**A**	0	5 (10%)
	B	5 (10%)	
Glue group	**A**	0	0
	B	0	
P			<0.001

RESULTS

Infections (7^{th} day)

The incidence of infection in suture group as compared to glue group was *statistically significant* ($P < 0.001$)

FOLLOW - UP

After 30 days:

the regularity of the wound edges and the overall cosmetic results were better in the glue group ($P < 0.001$)

Esthetical results after 30 days

	Sufficient *n* (%)	Good *n* (%)	Excellent *n* (%)
Suture group	18 (36)	29 (58)	3 (6)
Glue group	0 (0)	18 (36)	32 (64)
P*			< 0.001

FOLLOW - UP

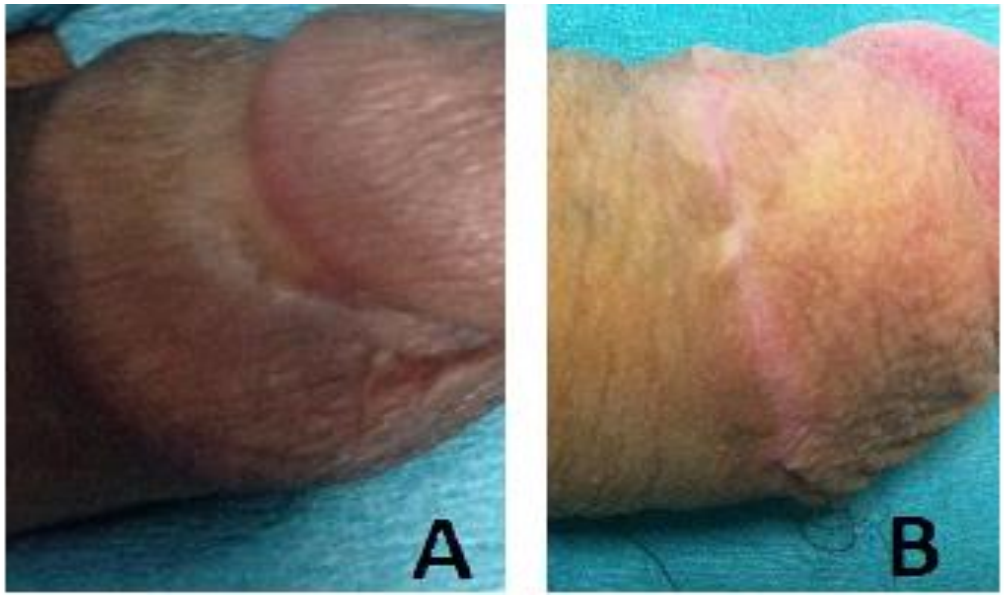
After 180 days:

cosmetical advantage of tissue glue was further confirmed ($P<0.001$)

Esthetical results after 180 days

	Sufficient *n* (%)	Good *n* (%)	Excellent *n* (%)
Suture group	13 (26)	32 (64)	5 (10)
Glue group	0 (0)	16 (32)	34 (68)
P*			< 0.001

Esthetical results after 180 days



A: GLUE GROUP **B: SUTURE GROUP**

CONCLUSION # 1

In the glue group operation time was significantly shorter and cosmetic results were significantly better compared to the suture one

CONCLUSION # 2

The possibility of avoiding the administration of a post-operative antimicrobial therapy is considerably advantageous in pediatric patients

CONCLUSION

For all these reasons, surgical tissue glue should be considered a **better alternative** to adsorbable sutures in pediatric circumcision



THANK YOU !