Journal of Pediatric Urology (2017) 13, 375.e1–375.e5

Triamcinolone injection for treatment of Mitrofanoff stomal stenosis: Optimizing results and reducing cost of care

P.P. Reddy, A.C. Strine, T. Reddy, P.H. Noh, W.R. DeFoor Jr, E. Minevich, C.A. Sheldon, B.A. VanderBrink

Division of Pediatric Urology, Cincinnati Children's Hospital Medical Center, Cincinnati, OH, USA

Correspondence to: A.C. Strine, Division of Pediatric Urology, Cincinnati Children's Hospital Medical Center, 3333 Burnet Avenue, MLC 5037, Cincinnati, OH 45229-3039, USA. Tel.: +1 513 636 4975; fax: +1 513 636 6753

Andrew.Strine@cchmc.org (A.C. Strine)

Keywords
Cicatrix; Hypertrophic; Surgical stomas; Urinary bladder; Neurogenic; Urinary diversion

Received 6 January 2017
Accepted 25 June 2017
Available online 4 July 2017

Summary

Introduction
Stomal stenosis is the most common complication after the creation of a continent catheterizable channel (CCC), but is challenging to treat.

Objective
To describe early experience with triamcinolone injection for the treatment of stomal stenosis.

Materials and methods
A retrospective review was performed of patients who had undergone a triamcinolone injection (40 mg/ml) for the treatment of stomal stenosis at the present institution. The primary outcome of success was defined as a patient-reported or caregiver-reported return to ease with catheterization, and avoidance of stomal revision or indwelling catheter. The cost of care with various techniques for the treatment of stomal stenosis was also assessed by representing the cost as a percentage of charges for a re-operative Monti ileovesicostomy.

Results
A total of 22 injections were performed in 18 CCCs of 17 patients. Demographic and clinical data are provided in the Summary Table. Thirteen CCCs (72%) were successfully treated with a single injection. Three patients (10%) required a total of five repeat injections at a median of 5.1 months between injections (IQR, 4.6–12.4). One patient required a stomal revision at 34.9 months after the initial injection, while one patient also required a Chait cecostomy catheter. The median length of time for ease with catheterization was 11.6 months (IQR, 3.5–18.0) after the initial injection, and 10.4 months (IQR, 4.5–16.0) after any injection. No adverse effects or complications occurred from the injection. There were no variables associated with failure after the initial or any injection on univariate analysis. Represented as a percentage of charges for a reoperative Monti ileovesicostomy, the cost of care was 11.3% for a stomal revision, 5.8% for triamcinolone injection in the operating room, and 0.3% as an office-based procedure.

Discussion
The success rate for triamcinolone injection favorably compared with other options for the treatment of stomal stenosis. It surpassed the reported success rate of stomal dilation and approached that of stomal revision. Other studies have similarly observed a minimal risk of adverse effects and complications from both topical and intralesional corticosteroids. The limitations of the present study included its retrospective design at a single institution. A larger cohort of patients with a longer follow-up is necessary to determine its long-term durability.

Conclusions
Triamcinolone injection was an effective and well-tolerated option for the treatment of stomal stenosis in any cutaneous stoma, thereby avoiding the need for a more invasive and costly stomal revision.

http://dx.doi.org/10.1016/j.jpurol.2017.06.007

Summary Table Demographic and clinical data.

Median age at surgery in years (IQR)	10.5 (7.9—12.2)
Gender (%)	
Male	7 (41)
Female	10 (59)
Primary diagnosis (%)	
Myelomeningocele	9 (53)
Cloaca, cloacal exstrophy, and variants	4 (23)
Sacral agenesis	2 (12)
Tethered cord	1 (6)
Prune belly syndrome, anorectal malformation	1 (6)
Type of CCC (%)	
Appendicovesicostomy	8 (44)
Monti ileovesicostomy	4 (22)
Spiral Monti ileovesicostomy	1 (6)
Malone appendicocecostomy	2 (10)
Malone appendicocecostomy with cecal extension	1 (6)
Monti ileocecostomy	1 (6)
Neo-Malone with cecal flap	1 (6)
Split-appendix technique (%)	10 (56)
Location of stoma (%)	
Right lower quadrant	14 (78)
Left lower quadrant	2 (11)
Umbilicus	2 (11)
Prior intervention (%)	
Temporary placement of indwelling catheter	6 (33)
Topical corticosteroids	13 (72)
Stomal stopper or L stent	5 (28)
Stomal dilation	1 (6)
Stomal revision	4 (22)
Subfascial revision	1 (6)
Anesthesia for injection (%)	
General anesthesia	20 (91)
No anesthesia	2 (9)
Median time from creation of CCC to injection in months (IQR)	26.1 (13.1—48.8)
Median follow-up in months (IQR)	10.9 (7.0—21.5)

CCC, continent catheterizable channel.

Introduction

Continent reconstruction allows for preservation of renal function, achievement of social continence, independence of care in patients with persistent urinary and/or fecal incontinence, and a progressive deterioration of renal and bladder function despite maximal medical management. Since its initial description by Mitrofanoff, the creation of a continent catheterizable channel (CCC) has been widely used as a reliable means with which to perform CIC and/or administer an anterograde enema after continent reconstruction [1]. Stomal stenosis is the most common complication with an incidence between 6 and 40% [2—4]. It typically occurs within 2 years of continent reconstruction but may also present in a delayed fashion [5]. A variety of surgical techniques have been described to minimize the risk of stomal stenosis [2,3]. Its treatment, however, is challenging once it develops. Stomal stenosis is often progressive and refractory to conservative measures, requiring a stomal revision.

Formation of scar is an integral component of wound healing. This process occurs over months and involves three distinct but overlapping stages of inflammation, proliferation, and remodeling. Collagen is deposited by fibroblasts and subsequent remodeled during wound healing. Intralesional corticosteroids have therefore been recommended for the treatment of hypertrophic scars in other specialties but have seldom been reported for the treatment of stomal stenosis [6,7].

The present sought to describe early experience with triamcinolone injection for the treatment of stomal stenosis. It was hypothesized that a triamcinolone injection would be successful, thereby avoiding the need for a more invasive and costly stomal revision.

Materials and methods

After approval from the Institutional Review Board, a retrospective review was performed of patients who underwent a triamcinolone injection for the treatment of stomal stenosis at the present institution. All patients were identified through a query by Current Procedural Terminology codes. Demographic and clinical data were abstracted from their medical records.

A U-shaped or V-shaped flap was used to create the original stoma in all patients. Conservative measures with the temporary placement of an indwelling catheter, use of topical corticosteroids (0.5% triamcinolone acetonide or 0.05% betamethasone dipropionate), and/or use of a stomal stopper or L stent were discussed with all patients prior to undergoing a triamcinolone injection.

The primary outcome of success was defined as a patient-reported or caregiver-reported return to ease with catheterization, and avoidance of stomal revision or