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# Simple method of paraphimosis reduction revisited: Point of technique and review of the literature

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**Abstract** Paraphimosis is a urologic emergency that has the potential for serious penile injury, including gangrene and tissue necrosis, if left unattended for a period of time. Multiple different techniques for reduction of paraphimosis have been proposed. We present a novel approach to paraphimosis reduction that utilizes CoFlex®, a flexible self-adhering bandage. We also present a detailed review of the literature of conservative management options for paraphimosis.


## Introduction

Paraphimosis can occur when the foreskin of an uncircumcised male is left retracted behind the glans penis for a period of time. This results in a tight constrictive band of tissue causing vascular engorgement and swelling of the glans, which prevents easy reduction of the foreskin to its anatomic position. While paraphimosis can occur at any age, it is most common among adolescents and has been reported to occur in 0.7% of uncircumcised boys [1]. Paraphimosis is considered a urologic emergency and if left unattended for a period of time has the potential to cause serious injury including gangrene and tissue necrosis [2].

Once the diagnosis of paraphimosis is made, treatment includes reducing penile and glans edema followed by retracting the foreskin back over the glans to its anatomic position. Several noninvasive techniques have been described to aid in reducing paraphimosis, including gentle manual compression, ice, osmotic agents such as sugar, and compression wraps [3—6]. When conservative measures fail, more invasive methods are employed such as the puncture technique, glans aspiration, and the dorsal slit procedure [6—9].

Our standard approach to paraphimosis now is a modification of the technique initially described by Ganti *et al.* [3] which utilizes CoFlex®, a flexible self-adhering bandage. We review our initial experience using this

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technique and also present a review of the literature of conservative management options for paraphimosis.

## Technique

Once the diagnosis of paraphimosis is confirmed (Fig. 1a), local anesthesia is administered using topical EMLA (2.5% lidocaine and 2.5% prilocaine) cream on the glans/distal penile shaft and then covered by clear plastic wrap such as Tegaderm. After 20–30 min, the plastic wrap is removed. Alternatively, intranasal midazolam or an oral medication (Tylenol, oxycodone) may be given, or in combination with EMLA cream. We have not had to utilize a penile block in our experience. The edematous prepuce is not cleaned or manipulated.

One inch wide CoFlex® is cut approximately three inches in non-stretched length. The CoFlex® is placed around the edematous skin first and wrapped the length of the penile shaft (Fig. 1b). This is then wrapped around the phallus approximately three times. The first wrap is placed loosely and then the next two wraps are progressively tighter, which minimizes trauma to the prepuce. If the bandage has insufficient length another piece is wrapped on top of the first piece. The wrap is then left in place for 20 min. After 20 min has elapsed, the bandage is removed. We did have one patient who experienced autoreduction of his foreskin without the need for manual reduction upon removal of the wrap (Fig. 1c). If autoreduction does not occur, then gentle manual reduction can be employed. Once palpable confirmation of reduction is confirmed, the procedure is deemed a success. The patient's family is given instructions to place triple antibiotic ointment on the prepuce and follow up with Urology or their primary care provider for evaluation in 3–4 weeks.

## Results

Our initial experience to date includes four patients, all of whom experienced successful reduction of their paraphimosis (Table 1). There was no visible tearing of the prepuce observed in any of the patients following reduction. Successful reduction was obtained regardless of how long patients had paraphimosis prior to presentation, with a mean duration of 26.25 h (range 5–48 h).

## Discussion

An assortment of different reduction techniques have been proposed for the treatment of paraphimosis. There are no randomized, controlled studies in the current literature comparing the different techniques available [10]. Prior to employing more invasive techniques, such as the dorsal slit procedure or puncture techniques, attempts at reducing the foreskin with more conservative measure should be made.

### Anesthetic

There are several different options described to help obtain adequate pain control prior to making attempts at manual reduction of paraphimosis. Topical medications commonly utilized are 2% lidocaine gel or EMLA (2.5% lidocaine and 2.5% prilocaine) cream which can be applied directly to the skin for up to an hour prior to reduction [9,11]. Oral or intravenous narcotics are often used as adjuncts along with these topical anesthetics to achieve optimal pain control. In cases where good pain control is proving difficult to achieve or more invasive procedures are needed, a dorsal penile block with one percent lidocaine without epinephrine can be performed [6,9,12]. Also described is the use of local infiltration using one percent lidocaine without epinephrine directly into the foreskin, particularly when Adson forceps or Babcock clamps are used to grasp the foreskin during reduction [6,11]. Conscious sedation or general anesthesia is typically reserved for cases refractory to more conservative measures of reduction.

### Manual reduction

Manual compression alone may be sufficient to reduce glans and distal penile edema to allow for successful reduction of the retracted foreskin. Circumferential pressure is applied with a gloved hand to the distal penis for several minutes to reduce swelling. Once enough fluid has passed proximally back underneath the tight constrictive band, attempts at manual reduction can be made [9]. Both thumbs are placed on the distal glans, while counter-traction is applied on the foreskin with the index and long fingers of both hands, which are placed just proximal to the tight constrictive band. Also described is the technique where the thumb of one hand is used to push down on the glans, while the palm of the other hand has encircled the distal foreskin to help achieve reduction [12]. Instruments have been utilized including Adson forceps to grasp and help pull the constricting band over the glans [11]. Also described are the use of Babcock clamps which can help grasp and reduce the entrapped foreskin [13].

### Ice and pharmacologic agents

The "iced-glove" technique has been proposed as another adjunct in reducing paraphimosis. This method relies on a combination of cooling and compression to help decrease penile edema [4]. An osmotic agent, such as sugar or 50% dextrose solution, can be used for the treatment of paraphimosis. These agents reduce swelling by creating a high solute concentration gradient that draws fluid from the edematous foreskin tissue; it can take 1–2 h to see a noticeable effect [5,6]. Another reported technique to reduce foreskin edema is the use of hyaluronidase, but this may be considered more invasive given the need for injection of this substance into the edematous paraphimotic foreskin [14].

## Compression wraps

Ganti *et al*. initially described the application of Ace® wrap for paraphimosis. They utilized a 2-inch Ace® bandage wrapped around the penis starting at the glans, which was removed after five to 7 min [3]. The wrap generates constant gentle pressure that pushes fluid proximally back underneath the tight constrictive band of tissue.