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Checklist assessment tool to evaluate suitability and success of neonatal clamp circumcision: A prospective study

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Summary

Background

The American Academy of Pediatrics (AAP) Task Force on Circumcision has called for the development of standards of trainee proficiency in regards to evaluation and technique for neonatal clamp circumcision (NCC). At the present time, there is no standardized or general consensus on patient selection for NCC. An improved method to evaluate newborns for NCC is an important first step in this process. Therefore, the authors collaborated to identify criteria useful in the evaluation of newborns for suitability for NCC, and for assessment of success after NCC and have named it "Checklist Assessment for Neonatal Clamp Circumcision Suitability."

Methods

A national multi-institutional collaboration was created to obtain consensus on objective criteria for use in determining patient suitability for NCC, and for assessing post-circumcision success outcomes. Criteria included elements from detailed medical history, bedside physical examination, and post-circumcision follow-up. Patients desiring NCC were enrolled consecutively and prospectively. The Checklist was followed to determine which newborns were suited to NCC, and NCC was done in those cases. The patients' caretakers were given post-circumcision care instructions and a follow-up appointment. Post circumcision, the Checklist was followed to determine if the procedure resulted in a successful circumcision or if there were complications.

Results

A total of 193 cases were enrolled prospectively and consecutively from January 2014 through October 2014. The mean age was 15 days (1–30 days). Of those 193 patients, 129 (67%) were deemed suitable for circumcision and underwent NCC. Post-circumcision assessment showed a 100% success rate with no complications. A total of 64 (23%) cases were deemed unsuitable for NCC because at least one checklist criterion was not satisfied, most commonly: penile torsion ($n = 25$), chordee ($n = 19$), and penoscrotal webbing ($n = 19$).

Discussion

Use of the Checklist in the present study has demonstrated a method of patient screening resulting in a 100% success rate with no complications. A high proportion of patients (33%) was identified as unsuited for NCC; however, the patient population consisted of newborn males referred to pediatric urology, and thus does not represent the general population, which is expected to have a lower proportion of unsuited patients. Regardless, the Checklist has the potential to enhance the decision-making process for both urologic and non-urologic care providers.

Conclusions

The use of the "Checklist Assessment for Neonatal Clamp Circumcision Suitability" assessment tool improves identification of patients unsuited for NCC and thereby potentially decreases the likelihood of circumcision-related complications.

Introduction

The annual rate of routine neonatal circumcision in the United States is approximately 54.7% of all newborn males, corresponding to over 1.3 million annual neonatal circumcisions [1,2]. Obstetricians, pediatricians, and family physicians are the principal providers who perform neonatal clamp circumcision (NCC) [3]; however, it is the urologist who serves as the caretaker for the newborn male presenting with anatomical anomalies requiring complex circumcision, or complications resulting from prior attempts at NCC.

Performing NCC requires not only adequate education and proficiency in procedural techniques, but also an appropriate comfort level in assessment of the newborn male for suitability for NCC. Assessment of suitability is the proper patient selection by means of actively screening for specific factors that may impact a certain procedure, thus providing the lowest possible complication risk to the patient. Despite the routine nature and relative simplicity of NCC, there are significant complications such as bleeding, infection, iatrogenic injury to the penis, and poor cosmetic outcomes [4]. There are multiple risk factors that may be present during the neonatal period, such as prematurity, low birthweight, and multiple congenital anomalies, thus impacting the decision to perform NCC [4].

At present time, there is little formal education among health providers to determine suitability for NCC, and when to request pediatric urologic referral [5]. In 2012, the American Academy of Pediatrics (AAP) Task Force on Circumcision called for the establishment of a consensus on evaluation, performance, and training for NCC [6]. An improved method to evaluate newborns for NCC is an important first step in response to this call. Therefore, the authors have collaborated to identify criteria to utilize in the evaluation of newborns for suitability of NCC. We have devised an assessment tool named "Checklist Assessment for Neonatal Clamp Circumcision Suitability" for use during the initial evaluation of male newborns. These guidelines are also intended to assess for success outcomes after NCC.

Patients and methods

Checklist creation

A national, multi-institutional collaboration of eight pediatric urologists was created and consisted of participants practicing in both academic and private practice settings. The collaboration evaluated numerous examples of penile anomalies and determined whether or not the anomaly was a contraindication for NCC. A consensus was reached by the collaboration as a whole. Based on the agreed upon contraindicated anomalies, specific objective criteria were established that would assist a practitioner in identifying newborn males with any of the contraindicated anomalies, and thus objectively identify newborn males who are suited for NCC and conversely those whose penis is unsuited to NCC. The collaboration also came to a consensus on criteria to be used in assessing success outcomes.

Components of the checklist

The "Checklist Assessment for Neonatal Clamp Circumcision Suitability" assessment tool is devised so as to promote ease-of-use for the practitioner within the outpatient setting. It is separated into three separate sections: "Medical Clearance," "Exam at Bedside," "Exam After Retraction of Prepuce" (Fig. 1).

Medical clearance

The first section assesses the patient for general medical conditions that are associated with increased risk during NCC. This includes weight less than 5 pounds, history of bleeding diathesis, congenital heart disease, and gastroesophageal reflux. If any of these conditions were present, the practitioner is instructed to defer NCC to a later date and to consult the appropriate specialist if necessary.

Examination at bedside

This second section is separated into four sub-sections: "Penile Shaft," "Glans Corona," "Skin Surfaces," and "Penis Median Raphe." To ensure an accurate bedside examination, the practitioner used two fingers to gently push down around the peno-pubic and peno-scrotal region. The first section evaluates the male newborn penis for adequate length (i.e., excludes micropenis), absence of significant curvature defined as greater than 30° (i.e., excludes chordee), and absence of significant penile torsion defined as greater than 45 degrees of rotation. The second section evaluates for prominence of the corona ridge (i.e., assures the ability to pen mark site of circumcision). The third section evaluates for a circumferential prepuce meatus (i.e., heightens awareness to assess penile anomalies after the foreskin is retracted), a normal penopubic crease (i.e., excludes features of buried penis syndrome), and normal penoscrotal junction (i.e., excludes penoscrotal webbing). The last section evaluates for a straight penile raphe median raphe. If the male newborn fails to meet *any* of the above criteria, the practitioner is instructed to stop and request pediatric urologic referral. The exception to this rule is if an abnormal penile median raphe is present and was the only criteria the newborn male failed to meet. In this instance the practitioner is instructed to proceed with a heightened awareness and assess for potential abnormalities (e.g., hypospadias or chordee) after retraction of prepuce.

Examination after retraction of prepuce

This last section is separated into two sub-sections: "Urethra Meatus Position" and "Glans." After proper administration of anesthesia, and lysis of inner preputial adhesions, the prepuce is retracted. The Checklist does not recommend any particular method of local anesthesia; however, in this study penile nerve block was used. The practitioner is prompted to assess for normal positioning of the urethra meatus (i.e., excludes hypospadias), a normal glans size (i.e., excludes glans abnormality), and straightness of the glans in respect to the penile shaft (i.e., excludes chordee). Once again, if the male newborn fails to meet any of the above criteria the practitioner is instructed to reduce the retracted foreskin, abort the circumcision, and request pediatric urologic referral.

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