

NOTE ON SURGICAL TECHNIQUE

Novel penile compression technique of penile surgeries “Penile strap”

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Summary

Introduction: Penile compression using a tourniquet is common with several materials and designs that have been previously described. The objective of the tourniquet is to induce an artificial erection through corporal occlusion for intra-operative penile curvature assessment or to obtain a clear visible bloodless surgical field.

Objective: We sought to describe our novel step-by-step technique of applying penile tourniquet using silicone Penrose drain tube designed as a strap by creating a small hole on the side of the tube to obtain a loop at the base of the penis

Conclusions: This novel technique is simple, effective and requires no additional materials nor special equipment, and facilitates the application and release of a tourniquet during penile surgery.

KEY WORDS: Penis; Penile surgery; Tourniquet; Penoplasty, Surgical technique.

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INTRODUCTION

Penile surgery is common in general and reconstructive urology. Frequently, surgeons apply intra-operative penile compression called Tourniquet – derived from the French verb “to turn” – at the base of the penis to induce an artificial arterial erection to assess penile curvature. Furthermore, tourniquet use allows a bloodless surgical field and an adequate hemostatic control in either emergency or elective settings. The aim of the tourniquet in penile surgery is to compress and constrict distal penile blood outflow by corporal body occlusion (1). Routine use of a tourniquet is safe respecting occlusion time and the exerted pressure to avoid complications (2). There is no standardized penile tourniquet design nor specific material recommendation. Several material types have been used (for example silicone, rubber, and latex) in numerous forms such as catheters, bands, rolled gloves and drains secured either by a simple knot tie or by a two-turn loop fashion by clamping in order to maintain the pressure inside both corpora cavernosa (3-5). In an attempt to respect the recommended occlusive compression time of less than 30-40 minutes (2), surgeons may require to release and to reapply the tourniquet several times during the surgery. In contrast, repeating tourniquet applications and releasing could decrease the intra-

operative efficiency. We hereby describing our novel technique of penile tourniquet application using a silicone Penrose tube designed as a strap.

This technique increases the operative efficiency and simplifies the application of a tourniquet for any type of penile surgery.

Technique

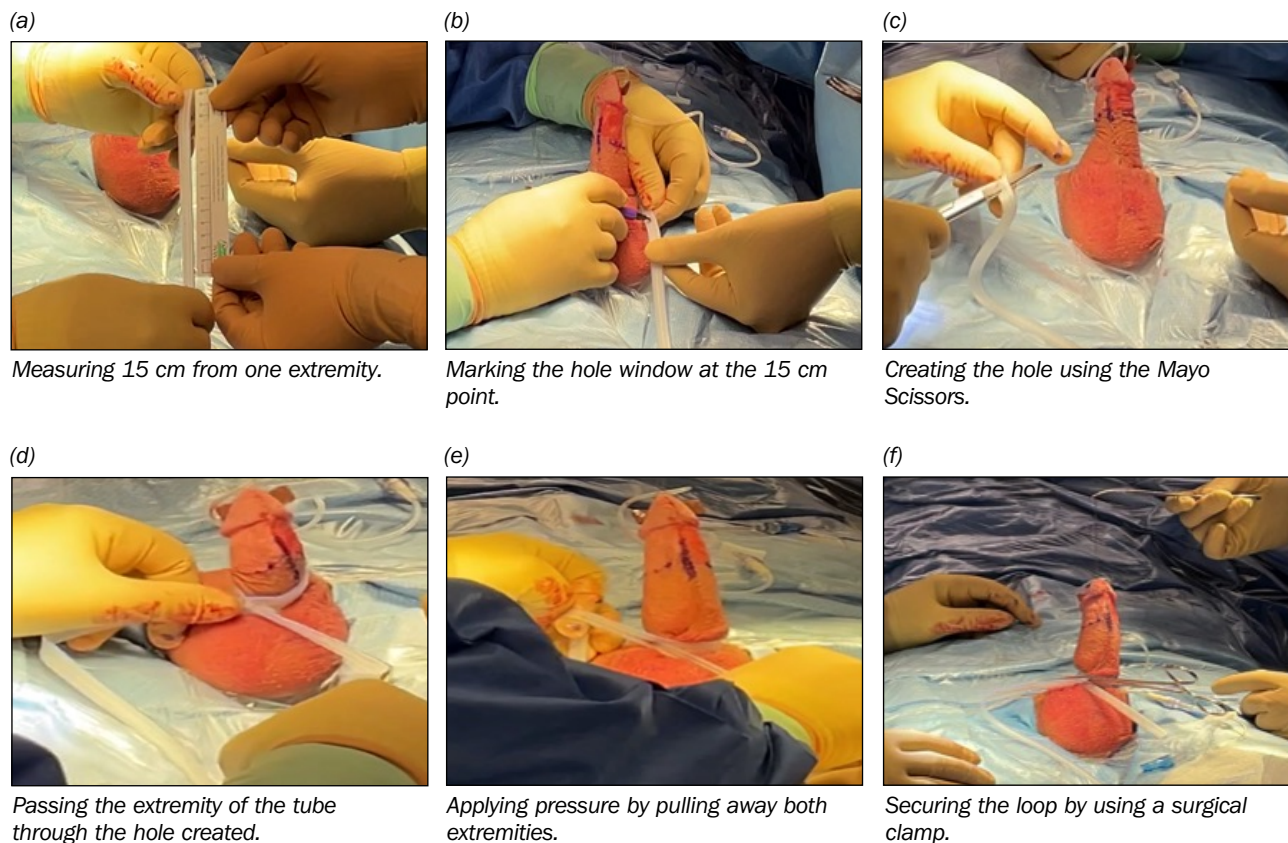
This technique was designed by an experienced penile reconstructive surgeon who performed and tested various tourniquet techniques. Our technique consists of the application of sterile Penrose silicone tube drain (Medline® Ref.DYND50427, Size: 45.72 cm x 0.64 cm). In this purpose, we utilize all Penrose length (45.72 cm) without shortening the tube. First, we create the tourniquet part of the tube by using about 15 cm of the tube length as a loop. Then, we create a small 0.8 cm through and through hole in the 15 cm point using a surgical Mayo scissors. The extremity of the drain is then passed through this small window. We apply then the tourniquet loops around the base of the penis and secure the loop by pulling away both extremities to create the desired compression on the corporal bodies. The tourniquet will be self-retained, anti-slip through the silicone surface characteristics and the hole resistance. Additional clamping may be beneficial to increase or to maintain the exerted pressure. Lastly, releasing the tourniquet will be achieved by removing the clamp if present or simply by untightening both Penrose tube extremities. This maneuver can be repeated several times during the surgery without removing the tourniquet from the base of the penis. The tension exerted through the tourniquet is adjustable according to the pressure desired. In our experience, no complications, failures nor difficulties were encountered, and the application of this novel technique is reproducible and easy to perform (Figure 1).

DISCUSSION

To our knowledge, this is the first article describing this technique. There is a paucity of data regarding the various tourniquet types and safety use guidelines for penile surgery. Gupta *et al.* (6), studied the different type of penile tourniquet with an author’s design of silicone strip tourniquet secured by tubectomy ring.

Figure 1.

Step-by-step technique (a-f).



In our center, we examined the application of silicone Penrose drain tube designed intra-operatively as a self-gripped strap with or without additional securing clamp to maintain the pressure. Furthermore, we found that this technique helps to maintain the tourniquet at the base of the penis all over the surgery in either released or tightened fashion. Tightening or un-tightening the tourniquet is achieved by simply pulling or releasing both extremities respectively. This technique doesn't require any additional materials or resources and require exclusively a silicone Penrose tube and surgical Mayo scissors to create the small window. Penrose drain is widespread available and currently used by many urologists as a tourniquet in several forms. We modified the usage of silicone Penrose for this indication by inventing this strap-like tourniquet design. The aim of our study is to describe an effective technical surgical step that could interest current and future reconstructive urologist that we perceive as simple and easy to perform. However, our study is limited by its descriptive non-comparative design with no intention to prove superiority among other tourniquet techniques in terms of either facility or functional outcomes. We found this technique is easy with similar satisfactory operative objectives in terms of bleeding control and corporal occlusion. In addition, the use of tourniquet is advantageous during penile curvature surgery in order to achieve best results notably in cases of solitary saline infusion or vasoactive agents injection failure. Surgeon should consider that penile tourniquet could compromise precise

assessment of penile curvature through penile geometrical alteration especially in the presence of penile deformities at the base of the penis (hour-glass deformity, indentations).

However, this technical field needs further studies to assess and to compare different tourniquet designs and to evaluate the exerted local mechanical pressure effects on the penile tissues and vascularity (dorsal penile arteries) and glandular supply. Our future suggestion is to create a penile tourniquet inspired by our design with either self-locked strap or buckle band (e.g., tongue/button and holes) with a pressure graduation measurement.

CONCLUSIONS

This novel technique of penile tourniquet is effective, reproducible and easy to perform to achieve complete corporal bodies occlusion for various penile surgery. Further studies are warranted to compare different tourniquet designs with penile mechanical pressure evaluation.

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Conflict of interest: The authors declare no potential conflict of interest.