

Posterior Urethral Valve Resection: Comparison of Use of Cold Knife with that of Hot Knife

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Objective: To compare the results of valve resection surgery by use of cold knife with those of hot knife.

Material and Methods: Medical record of consecutive 28 patients, who underwent transurethral resection (TUR) of posterior urethral valve (PUV) was searched and patients were placed in two groups; those who underwent TUR with diathermy hook electrode (hot knife) were placed in one group (hot knife group) and those in whom cold knife was used for TUR were placed in the other group (cold knife group). Evaluation was done by comparing the time taken for resection, presence or absence of bleeding at the time of surgery, need for another session of valve resection, incidence of iatrogenic injury and length of hospital stay after surgery.

Results: There were 14 patients in each group. There was no significant difference in the two groups as far as duration of surgery, incidence of iatrogenic injury and length of hospital stay was concerned. No bleeding took place in the hot knife group while small amount of bleeding took place in one patient of cold knife group. None of these patients required second session of surgery for residual valve.

Conclusion: Cold knife is at least as safe as hot knife for the purpose of resection of PUV.

Key Words: Posterior urethral valve, transurethral resection.

Introduction

Many techniques have been used for the resection of posterior urethral valve.¹ Open resection, blind avulsion with a balloon catheter and rupturing of valve with metallic sounds all have been used before the introduction of infant size resectoscopes. Since then, valve fulguration using hook or ball electrode has become the most popular technique for this purpose. When instrument makers started offering different types of cold knives for use with their resectoscopes, another option became available to the endoscopic surgeon. The main advantage of use of cold knife is the elimination of electrical current that has the potential of inflicting serious urethral injuries.

Material and Methods

A retrospective study was done to compare the effectiveness and safety of PUV resection by diathermy hook electrode with that of a cold knife. When we started treating PUV patients at Rafiq Anwar Memorial Trust Hospital, Gujranwala, initial 14 consecutive patients were treated by using diathermy hook electrodes. We later switched to the use of cold knife for this purpose. This provided us with the opportunity of making two equal groups (group A, the hot knife group and group B, the cold

knife group) of patients for evaluation of the two techniques. All the patients were operated upon by the author himself. Richard Wolf resectoscope of 9 Fr size was used in all patients. In group A patients, right angle hook electrode attached to diathermy was used to incise the valve at 12 o'clock position, keeping the current as low as possible for incision. In group B patients, right angle cold knife was used to incise the valve at 12 o'clock position. Adequacy of the procedure was assessed by observing the urinary stream emerging from a full bladder on withdrawal of resectoscope. Light supra-pubic pressure was used to facilitate the evacuation of urine in all patients. Foley's balloon catheter was then passed and kept in place for one week in all patients. Catheter was removed on the 7th day in all patients and voiding was observed. After resumption of successful voiding, patients were discharged from the hospital.

Results

Average time taken for the procedure to complete in group A patients was 38 minutes and 25 seconds while in group B patients this average came out to be 36 minutes and 44 seconds. Mild bleeding was encountered in one patient in each group that did not require any intervention. None of the patients in either group required another session of surgery.

However this injury was not caused by diathermy electrode in any way. No iatrogenic injury was encountered in group B patients. It was our policy to keep the patients hospitalized for 7 days. None of the patients from either group required extension of this period.

Discussion

With the invention of Hopkins rod lens system, miniaturization of uroscopes became a reality. This invention changed the treatment protocol for patients of posterior urethral valve. Many of PUV patients who had to grow with urinary diversion for many years, no longer had to wait that long and many of them can now be offered definitive treatment in neonatal life.²

Diathermy electrode became more popular for endoresection purposes as it not only offered a quick way of cutting the tissues, it at the same time achieved haemostasis very efficiently. As the techniques refined and technology improved, diathermy electrodes became the tools of choice for otherwise bloody resections like transurethral resection of prostate. When infant size resectoscopes became available, the scope of diathermy electrodes widened and diathermy hook electrode soon became the tool of choice for ablation of PUV.

However there are some limitations and risks associated with the use of diathermy electrodes in infant urethra.⁴ The tissues of infant urethra are very delicate and available working space is limited. This can result in inadvertent current transmission to healthy urethral wall in the adjoining area resulting in burns and subsequent stricture formation.³ This prompted many workers to use cold knife in place of hot diathermy hook. Valve can be incised at as many places as one prefers to. As a result of such incisions the membrane of PUV attains the form of free moving swing door-like structures not capable

of producing resistance to the out flow of urine. Very often, a single incision at 12 o'clock position is all that is required to convert an obstructing posterior urethral membrane (PUV) into non-obstructing flaps of tissue. The only injury that cold knife can inflict is clean, sharp linear incision extending into the wall of urethra. Experience with Otis urethrotome has shown that an incision made at 12 o'clock position, extending even into the sphincter heals without any consequences. This advantage prompted us to use cold knife to incise PUV.

Though many shapes of cold knives are now available, the right angle hook with cutting edge towards the endoscopist or the sickle shaped knife that cuts in the same fashion are more suited for this purpose. Barber et al have recently reported their experience with a modified optical (cold) urethrotome.⁵ A sharp complete incision at 12 o'clock position can usually be made in 2-4 movements of the knife across the membrane. Valve tissue generally does not bleed on incision and field remains clear during surgery. We encountered bleeding once when the incision reached near urethral wall at 12 o'clock position. This bleeding did not require any intervention.

Conclusion

Our experience, though limited has shown that cold knife is at least as efficient and safe as the hot diathermy electrode. There was no significant difference between the duration and efficiency of surgery, complications or hospital stay. We believe that cold knife has an advantage of safety over hot knife as there is no chance of inadvertent burning of delicate urethral tissues.

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