

EDITORIAL COMMENTS: CURRENT TECHNIQUES FOR TREATING URETEROPELVIC JUNCTION OBSTRUCTION

EDITORIAL COMMENT - I

The previous section deals with the newest modalities available for the treatment of ureteropelvic junction obstruction. With an emphasis on minimally invasive techniques, each article tries to provide a compelling argument for their particular method.

The paper by Gettman and Segura nicely summarizes the accepted technique of antegrade endopyelotomy. The authors discuss the use of the cold knife for the incision as well as laser and electrosurgical energies. There are the accepted risks of bleeding as with other incisional techniques. The antegrade approach gives the surgeon the best visualization and control of vessels that might be encountered of any of the minimally invasive techniques while also providing some of the best long term patency results. A relative disadvantage any antegrade technique is the presence of a draining nephrostomy tube.

The Acucise technique of endoureterotomy has been established as a safe and effective minimally invasive maneuver for the treatment of obstructed UPJ segments. Of the three methods discussed here, it is the least invasive although some control over exact site of incision is lost. In experienced hands the risk of severe bleeding is less than 1%. The Acucise technique is not without shortcomings however. Ureters with high insertions will do not do well with this method and there is also a risk of stent misplacement as there is not complete control using fluoroscopy alone.

In the paper by Jarret we are given the impression that laparoscopic pyeloplasty is a viable alternative to other minimally invasive therapies. In fact when all is well patients can often go home by 23 hours with an internal stent. Unfortunately the intracorporeal knot tying is quite difficult despite the Endostitch device. Though advances in laparoscopic urology are important, this operation in its current state is not a procedure for the general practicing urologist. It is also difficult to accept the argument that it is less invasive than an antegrade endopyelotomy.

A modality not presented in this series of papers is ureteroscopic endopyelotomy. Developments in ureteroscopic technology including the smaller quartz fibers for laser energy delivery and endoluminal ultrasound have lead to yet another minimally invasive technique for treating UPJ obstruction. Bagley (1) has been at the forefront of this approach and reports an 81% success rate. Identifying a crossing vessel using the ultrasound can guide the decision on where to make the incision with more accuracy. As with the Acucise technique there is still a risk of stent misplacement.

The financial aspects are also important to review. At one cost extreme there is the laparoscopic pyeloplasty. In general for the laparoscopic procedures to be financially justified, one expects that every extra hour operating should save a day in the hospital. At the other extreme it has been shown that the Acucise procedure can be performed in a relatively inexpensive radiology suite and patients can be discharged within six hours. Naturally cost is only one aspect of the choice of approach. As with all of these techniques, patient selection is the ultimate preoperative challenge. The poorly functioning or severely distended kidney is a poor candidate for almost any technique. To be well versed in many different techniques for the treatment of the obstructed UPJ can only help the patient.

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EDITORIAL COMMENT - II

Open operative intervention for ureteropelvic junction (UPJ) obstruction provides a widely patent, dependently positioned, well-funneled ureteropelvic junction. While the procedure has stood the test of time and offers a success rate exceeding 95%, several alternatives to standard operative reconstruction are now available that can provide this result in a less invasive manner. For all of these newer approaches, the advantages include a significantly reduced length of hospital stay and post operative recovery. However, for many of these procedures the success rate does not approach that of standard open pyeloplasty. Furthermore, while open operative intervention can be applied to almost any anatomical variation of UPJ obstruction, consideration for any of the less invasive alternatives must take into consideration individual anatomy including, but not limited to, the degree of hydronephrosis, overall and ipsilateral renal function, and in some cases, the presence of crossing vessels or concomitant calculi.

Three papers in this month's Brazilian Journal of Urology address many of these issues, and at the same time, provide detailed descriptions of three of the more widely accepted and utilized minimally invasive alternatives to standard open pyeloplasty.

Percutaneous endopyelotomy was first described over 15 years ago by Whitfield and Wickham as a percutaneous pyelolysis (1), and popularized in the United States by Smith (2) who coined the term "endopyelotomy". As noted by Gettman and Segura, in their paper regarding the technique of percutaneous endopyelotomy, this approach has provided success rates that generally exceed those of the Acucise balloon, but still do not compare to open operative reconstruction. The disadvantage compared to retrograde fluoroscopic and endoscopic techniques is the more invasive manner in which the ureteropelvic junction is accessed, that is, percutaneously rather than in a retrograde fashion via the ureter. As such, the length of hospitalization is marginally increased over that associated with the retrograde procedures. However, a clear indication for the percutaneous approach is the presence of upper tract calculi, which can then be man-

aged simultaneously. Again, the presence of crossing vessels need not be a major consideration as these can be identified during the endopyelotomy and avoided.

The technique is well described by these authors and has become a standard part of the urologic armamentarium. We have used a modification that involves placement of the endopyelotomy stent prior to the actual endopyelotomy incision, and have found that this tends to further define the ureteropelvic junction itself. With the stent in place, a Collins' knife or Bugbee electrode is used on a pure cutting current to cut down onto the stent in a fashion analogous to a ureteral meatotomy. In addition to further defining the site and orientation for the actual endopyelotomy incision, placement of the stent prior to actual incision has allayed our concern regarding potential disruption of the UPJ when trying to place a stent in an antegrade fashion following the incision itself.

Drs. Delvecchio and Preminger, describe their technique for use of the Acucise cutting balloon. This technique gained rapid acceptance in the United States because, as noted by Drs. Delvecchio and Preminger, only standard cystoscopic equipment is needed along with real-time fluoroscopy. The technique is readily learned with a short "learning curve" and the results are acceptable, though certainly do not approach those of open pyeloplasty. Contraindications to this technique include the presence of concomitant calculi which are not addressed with this procedure, and a long segment of stenosis, that is, greater than 2 cm in length.

An area of controversy is the presence of crossing vessels. While such vessels may not functionally impact on the overall success of the technique, many investigators feel they do present a risk of hemorrhage during this fluoroscopically guided procedure, and as such may represent a contraindication.

As initially described, the technique includes placement of a 14/7 French endopyelotomy stent at the completion of the procedure, and this is left in place for six weeks. As noted by these authors, most centers have reduced the time of stenting to four weeks

or even less. Furthermore, when large stents cannot easily be placed, especially in those patients who have not been pre-stented, equivalent results can generally be obtained with an 8 French stent.

The authors suggest that a true lateral incision should significantly decrease the incidence of post-operative hemorrhage, as vessels generally do not cross lateral to the UPJ. However, the risk of hemorrhage remains significant and is being reported with increasing frequency (3). As such, at our center, this technique has all but been replaced with direct vision ureteroscopic endopyelotomy utilizing a Holmium laser. The advantage of the ureteroscopic approach is that it allows direct visualization of the UPJ and assurance of a properly sited, full thickness endopyelotomy incision. If any vessels are encountered, these are easily visualized and avoided during the procedure. Another advantage of the ureteroscopic approach is a decrease in cost compared to use of the Acucise cutting balloon, at least when ureteroscopic equipment and a Holmium laser is already available. Even without the Holmium, equivalent results can be obtained with a small ureteroscopic Bugbee electrode using a pure cutting current.

Dr. Jarrett, in the last of these papers, describes the technique and results of a laparoscopic pyeloplasty performed at an experienced center. A laparoscopic approach, in the hands of such surgeons, can provide an excellent alternative both to less invasive and more invasive procedures. In contrast to endourologic management, this approach does allow an anatomic repair similar to that achieved with open

pyeloplasty. In comparison to open surgical intervention however, the hospital stay with a laparoscopic approach is generally shorter and the length of disability significantly reduced. Because an anatomic repair can be accomplished, the success rate approaches that of open pyeloplasty, and can exceed 95%. A laparoscopic approach is contraindicated in the setting of a particularly long segment of obstruction such that the proximal ureter and pelvis can not be brought together without tension. Another contraindication is the association of multiple caliceal stones, which may be difficult to access laparoscopically. With the increasing application of laparoscopic procedures in urology, laparoscopic pyeloplasty has the best chance of truly replacing standard open operative pyeloplasty.

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EDITORIAL COMMENT - III

The groups from Mayo Clinic, Duke University, and Johns Hopkins review their experience with treatment techniques for ureteropelvic junction (UPJ) obstruction.

With their vast experience at the Mayo Clinic, Drs. Gettman and Segura emphasize that the key to success is selecting patients properly. This not only applies to their discussion about percutaneous endopyelotomy but also to the other techniques. They note that for a poorly functioning kid-

ney and/or a massively dilated renal pelvis, surgery is often indicated. For percutaneous endopyelotomy, the Mayo Clinic group does not routinely assess preoperatively whether an accessory vessel or high insertion is present. They use a cold knife technique under direct vision rather than the Acucise® cutting balloon catheter. They note the critical anatomic work by Sampaio and colleagues regarding the location of crossing vessels and, therefore, make their incision laterally; it should be noted that these ana-

tomic studies show that the incision should be made lateral in reference to the kidney which is, in many cases, postero-lateral in relationship to the patient's torso. The overall success rate of eight reported studies is 90 percent for percutaneous endopyelotomy.

The technique or retrograde endopyelotomy utilizing the Acucise cutting balloon as detailed by DelVecchio and Preminger reflects the continued advancement in technologies with decrease in invasive procedures for the patient. The reduced profile balloon now allows retrograde ureteral access without preprocedural ureteral stenting. They also mention that the cutting wire is to be positioned laterally; again, however, it needs to be noted that this is lateral in relationship to the kidney, not necessarily the torso of the patient. Done properly the success rate approaches that of percutaneous endopyelotomy. Over 90% of failures occur within the first year. As with percutaneous endopyelotomy, an 8F ureteral stent is left in place for 6 weeks.

As reported by Jarrett, the technique of laparoscopic pyeloplasty adds one more advancement in decreasing morbidity and maintaining successful treatment of UPJ obstruction. The specific surgical technique used laparoscopically depends on whether or not a crossing vessel is present and whether or not

a high insertion is present. As with all new techniques, long-term success awaits further follow-up.

In summary, urologic techniques for dealing with UPJ obstruction continue to evolve resulting in decreased hospitalization and morbidity for the patient. Retrograde incision with the low profile Acucise® cutting balloon catheter offers low morbidity, short hospitalization, and high success rate for the majority of patients. For those patients in whom retrograde ureteral access cannot be accomplished or who have calculi in the pelviocalyceal system, percutaneous endopyelotomy offers high success and relatively low morbidity. Laparoscopic pyeloplasty will likely replace open surgery for those patients where neither retrograde Acucise® endopyelotomy nor percutaneous endopyelotomy is optimal.

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