Retrograde Acucise endopyelotomy

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The Acucise endoureterotomy balloon catherter has proved to be a safe and effective alternative to open surgery for the management of ureteropelvic junction and benign ureteral stricture disease. The established management of ureteroenteric strictures following urinary diversion is open surgical revision. There have been a few series reported on the use of Acucise for ureteroenteric strictures. In addition, Dr. Richard Babayan has performed several of these cases with and without publication.

Unfortunately, we have a few cases, because the Ministry of Health and Welfare haven't yet approve Acucise procedure in japan.

We have attempted to obtain these efficacy with the use of Acucise for ureteropelvic junction obstruction (UPJO) and ureteroenteric stricture. $B!! (J Every attempt should be made to delineate the causative factors of ureteral stenosis before the operation. It is recommended that a Spiral CT or an Endoluminal Ultrasound be conducted in order to determine the appropriate positioning of the cutting wire.

UPJO Surgery - Clinical Approaches

1) Open Pyeloplasty
2) Laparoscopic Pyeloplasty
3) Ureteroscopic Endopyelotomy/Endoureterotomy
4) Percutaneous Antegrade Endopyelotomy
5) Balloon Dilation/Dilatation
6) Acucise Endopyelotomy/Endoureterotomy

"Procedure of Choice"

INDICATIONS

1) Primary UPJO
2) Secondary UPJO

3) Proximal and Distal Ureteral Strictures

4) Strictures in the ureteral orifice (UO)

CONTRAINDICATIONS

1) Strictures > 2 cm in length

2) Stricture in the mid-ureter

3) Radiation therapy, retroperitoneal fibrosis

4) Ureteroenteric anastomotic strictures which cross the aorta or iliac vessels.

DIAGNOSTICS

1) IVP

2) Retrograde Pyelogram/Ureterogram

3) Whitaker test.

4) Furosemide Renogram (Lasix washout)

5) Renal scintigraphy

6) Spiral CT

7) Endoluminal Ultrasound

PROCEDURE

1) Preparation of staff, generator, equipment.

2) Gain access .035" guidewire via cystoscope.

3) Remove cystoscope.

4) Introduce Ureteral Access Sheath over guidewire.

5) Introduce Acucise, positioned correctly, over guidewire.

6) Under fluoro, advance Acucise just distal to stricture.

8) Perform a retrograde pyelogram through Sureseal II.

Dilute contrast (No Saline)

9) Advance Acucise over stricture radiopaque markers straddling stricture.

10) Verify position of cutting wire.

11) Plug electrosurgical wire into generator via adapter.

12) Place generator in the "Stand By" mode.

Partially inflate balloon to confirm correct placement.

13) Place generator in the "Ready" mode at 75W pure cut.

14) Simultaneously activate cutting wire for up to 5 seconds while fully inflating balloon to 2.2 cc. Someone else runs fluoro and counts to 5 sec.

15) Check for extravasation and/or disappearance of balloon waist to confirm incision.

16) Turn stopcock for 10 minutes of tamponade

17) Disconnect Acucise from generator after incision has been made.

18) Remove Acucise, keeping guidewire in place

19) Place Applied Medical 7/10F Endopyelotomy Stent for 4-6 weeks.

CUTTING WIRE POSITIONING

1) Primary UPJO or Proximal Ureteral Strictures above the Iliac Vessels

Straight Lateral Position

2) Secondary UPJO

It is recommended that a Spiral CT or an Endoluminal Ultrasound be conducted in order to determine the appropriate positioning of the cutting wire.

If the above is not possible, Straight Posterior position should be used, provided

The original operative note was reviewed and does not describe a dismembered pyeloplasty with posterior transposition of anterior crossing vessels.

3) Distal Ureteral Strictures below the Iliac Vessel to the Ureterovesical Junction

Straight Medial Position

4) Strictures in the Ureteral Orifice or Tunnel

Straight Anterior Position

TIPS TO ENSURE A SUCCESSFUL PROCEDURE

1) Verify cutting wire is positioned properly before cutting.

2) Power setting is 75 watts PURE CUT (never exceed 100 watts).

Power setting must never exceed 100 watts - never use coagulation mode.

3) Generator must be digital and recently calibrated.

4) Do not use Valley Lab SSE3A or SSE3B generators.

5) Never exceed 5 seconds of continuous cutting time.

6) Do not inflate the balloon beyond 2.2 cc.

7) Never use a safety wire.

8) Do not pre-test balloon or "purge" catheter.

9) Do not use saline.

10) Do not pull the guidewire down after the incision has been made.

11) Verify that the cutting wire is in the proper position BEFORE cutting.

12) Use of a cystoscope is not recommended - damage to the catheter may occur.

TROUBLESHOOTING

1) Catheter Cannot be Advanced

2) Catheter Doesn't Fire

3) No Extravasation is Seen

3) Bleeding

4) Warnings & Contraindications

Q : Are crossing vessels a concern when using the Acucise catheter?

A : Doctor, the risk of crossing vessels is actually very minimal.
A number of current studies report that the incidence of bleeding is less than 2%.

This study by Dr. Sampaio, published in "Journal of Endourology," examined the vascular anatomy surrounding the kidneys of 546 adult cadavers. He reported that if the cutting wire is placed in a precise lateral position for a primary UPJ obstruction, the incidence of bleeding is minimal.
In fact, he highlights a study by Drs. Anderson and Clayman, which reports a 0% incidence of bleeding when using this cutting wire position.

Some of the older clinical studies on Acucise report a higher incidence of bleeding.
It is important to note that at that time, these doctors believed that the cutting wire should be in a posterior-lateral position.

For secondary UPJ obstructions and ureteral strictures, the cutting wire position differs. The proper cutting wire positions are highlighted in the center of the green card provided with every

Acucise kit. Crossing vessels are only a concern when dealing with strictures in the mid-ureter, which is why Acucise is contraindicated for the treatment of these strictures. Many doctors choose to perform a spiral CT, especially for their first cases, to determine the vascular anatomy. Even with the spiral CT the overall cost of the Acucise procedure is far less than alternative treatments.

A spiral CT is always recommended prior to treating a secondary obstruction.

Reference

Sampaio: The Dilemma of the Crossing Vessel at the Ureteropelvic Junction: Precise Anatomic Study. Journal of Endourology, Vol. 10, Number 5, October 1996. (Reorder #ACU-005)

Q : Why would I do an Acucise procedure when an open pyeloplasty has a success rate of over 80%?

A : Doctor, as you may be aware, the Acucise procedure has consistently shown success rates of over 80%. Even though the success rate is slightly lower than that of open procedures, there are other significant advantages that make it a preferred first line of therapy.

When compared to other methods of treatment, especially open procedures, Acucise has been shown to be the least invasive and most cost-effective procedure. Acucise requires less O.R time and a shorter hospital stay. In addition, patient recovery time is significantly reduced and there is less postoperative discomfort.

Several studies highlight these benefits and recommend Acucise as a first line of therapy. This study by Dr. Brooks and his colleagues, featured in "Urology," compares Acucise with other procedures and finds Acucise has a high success rate, few complications, and greater patient tolerance. There are several other studies that I can give you copies of if you are interested.

What is important to remember is that in the rare case that an Acucise procedure fails, an open pyeloplasty can still be performed. When patients understand that Acucise is a far less invasive

procedure, they typically prefer this option, even though it has a slightly lower success rate.

References

Nakada, et al.: Acucise Endopyelotomy: Evolution of a Less-Invasive Technology. Journal of Endourology, Vol. 10, Number 5, April 1996.(Reorder #ACU-003)

Brooks, et al.: Comparison of Open and Endourologic Approaches to the Obstructed Ureteropelvic Junction. Urology, Vol. 46, Number 6, 1995.(Reorder #ACU-002)

Wolf, Jr.: Retrograde Acucise Endopyelotomy. Urology, Vol. 51, Number 6, June 1998.(Reorder #ACU- 004)

Q : Can Acucise be used on ureteroenteric anastomotic strictures?

A : There have been a few series reported on the use of Acucise for ureteroenteric strictures. In addition, Dr. Richard Babayan has performed several of these cases with and without publication.

Dr. Kabalin conducted this study, published in "Journal of Endourology," showing the efficacy of Acucise on treating ureteroenteric strictures. He concluded that Acucise offers significant advantages over other techniques because it creates a deep and complete incision of the ureteroenteric junction and produces lasting results. (Provided that the strictures do not cross the aorta or iliac vessels for which Acucise is contraindicated).

Background:

With removal of the bladder (radical cystectomy), the ureters must be diverted usually to a modified intestinal segment, often the ileum. In some of these patients, a stricture forms at an anastomotic site where a ureter is joined to the intestinal segment, i.e. a ureteroenteric anastomotic stricture develops. The treatment success of these strictures historically has been approximately 50-60%.

Reference

Kabalin: Acucise Incision of Ureteroenteric Strictures after Urinary Diversion. Journal of Endourology, Vol. 11, Feb 1997, pp. 37-40.

Q : Should the Acucise be used with UPJ obstructions secondary to a High Insertion?

A : The Acucise has been successfully used in many UPJO cases with a high insertion condition when the anatomy was understood. The key is making sure you are positioned above the high insertion, with the balloon straddling the UPJ.

After firing the catheter, a ureteroscope may be used to confirm that a complete incision has been made, as the wall of a high insertion UPJ is typically double in thickness.

Background:

A high insertion can be both a high and deep insertion of the ureter into the renal pelvis. The wall of the UPJ is typically twice as thick in this case and thus a complete incision is often more difficult to accomplish.

_ Acucise is not recommended for treatment of strictures greater than 2cm.
_ Acucise is not recommended for treatment of mid-ureteral strictures overlying the iliac vessels.
_ Acucise is not recommended for treatment of ureteroenteric anastomotic strictures which cross the aorta or iliac vessels.