

Role of Sonourethrogram and Retrograde Urethrogram in the Management of Urethral Strictures

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Running Title: Sonourethrogram and RGU in stricture

Abstract: ***Introduction:** Sonography has become the urologist's stethoscope, we evaluated stricture urethra with sonourethrogram and compared sonourethrogram to RGU. **Objectives of the study:** To compare the diagnostic accuracy of sonourethrogram and Retrograde Urethrogram. To find out the degree of spongiofibrosis by sonourethrogram. **Materials & methods:** This prospective study was done at Tirunelveli Medical College Hospital. The study period being January 2012- December 2012. After conventional grey scale imaging to evaluate the extent of disease, the location of bulbourethral arteries was evaluated using doppler USG and later compared to their location in men with normal urethra. **Results:** There was not much of a discrepancy between sonourethrogram and RGU. When there was 74% or more narrowing of urethral lumen outcome of VIU was poor. The degree of spongiofibrosis which could be identified only by sonourethrogram influenced therapeutic decisions. in 7% of cases. **Conclusions:** Sonourethrogram is a very useful modality in the evaluation of anterior urethral strictures. It is superior to retrograde urethrogram in stricture length and spongiofibrosis assessment, which aid in choosing the ideal therapeutic approach.*

Keywords: Retrograde Urethrogram, Sonourethrogram, Stricture urethra

1. Introduction

Stricture urethra is a very common urological disease. Common Etiology being inflammatory anterior urethral strictures and post traumatic bulbomembranous strictures. The standard diagnostic modality we use is Retrograde urethrogram and Combined Cysto Urethrogram. Since sonography has become the urologist's stethoscope, we evaluated stricture urethra with sonourethrogram and compared sonourethrogram to RGU, weighing the pros and cons of each.

2. Aims and Objectives

- To compare the diagnostic accuracy of sonourethrogram and Retrograde Urethrogram.
- To find out the degree of spongiofibrosis by sonourethrogram. Application of doppler USG to locate the bulbourethral arteries in men with normal urethra and to study anatomical alterations in men with urethral Stricture.

3. Methodology

This prospective study was done at Tirunelveli Medical College Hospital. The study period being January 2012-December 2012. Culture negative anterior urethral strictures were evaluated first by RGU/CUG followed by sonourethrogram. All cases included in the study were fresh cases with no prior VIVs or urethroplasties. Pelvic fracture urethral distraction defects (PFUDD) were excluded. The length of stricture, degree of spongiofibrosis, flow of saline thro the posterior urethra into the bladder, intraluminal pathology were noted. (6)After conventional grey scale

imaging to evaluate the extent of disease, the location of bulbourethral arteries was evaluated using doppler USG and later compared to their location in men with normal urethra.

4. Results

No.of cases studied - 50 cases. The parameters studied being length of stricture, degree of spongiofibrosis, percentage narrowing of urethral lumen. The results were correlated to urethroscopy - SPC scopy, VIU and urethroplasty findings of the same. Doppler USG localisation of bulbourethral arteries was done in 15 normal men and 15 men with urethral stricture. Out of 50 cases studied
Short bulbar strictures - 22 cases
Stricture of pendular and bulbar urethra - 15 case
Bulbomembranous stricture - 8 cases
Penile urethral stricture - 5 cases.

Common etiologies are BXO, post bacterial urethritis sequalae, traumatic catheterisation or long-term indwelling catheters, perineal trauma, post TURP, unknown etiology. One case was associated with extensive GUTB. There was no major discrepancy in the length of penile urethral strictures measured by RGU and sonourethrogram, compared with scopy/operative findings. In bulbar strictures there was a marked discrepancy between RGUs and sonourethrogram findings. Sonourethrogram measured length was more than that detected by RGU in 33 out of 45 cases (73%). Length discrepancy varied between 2mm and 2.5cm. Out of these 33 cases, in 7 cases sonourethrography correctly indicated a reconstructive procedure different from that originally suggested by conventional urethrography. % narrowing of urethral lumen was measured by the urethral diameter at the area of maximum stenosis and at the normal

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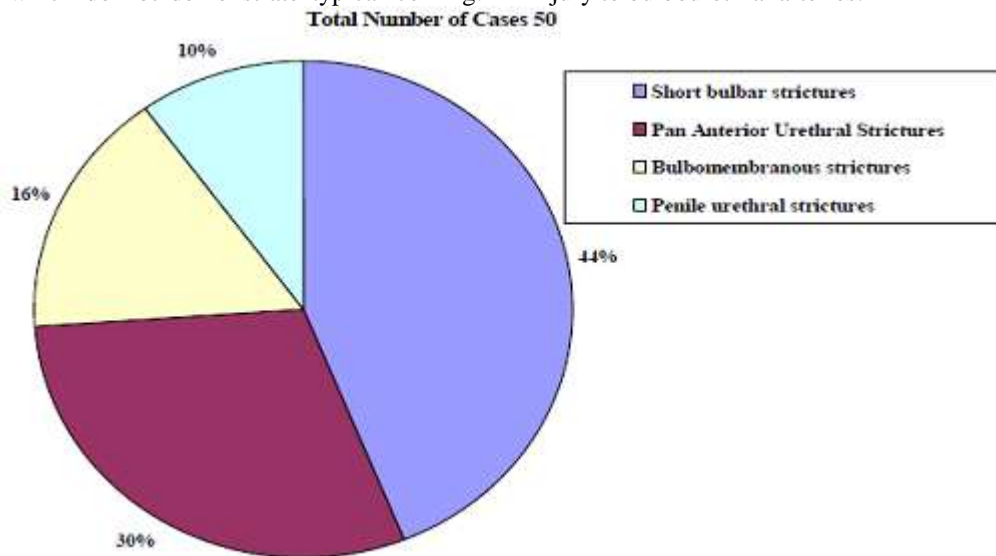
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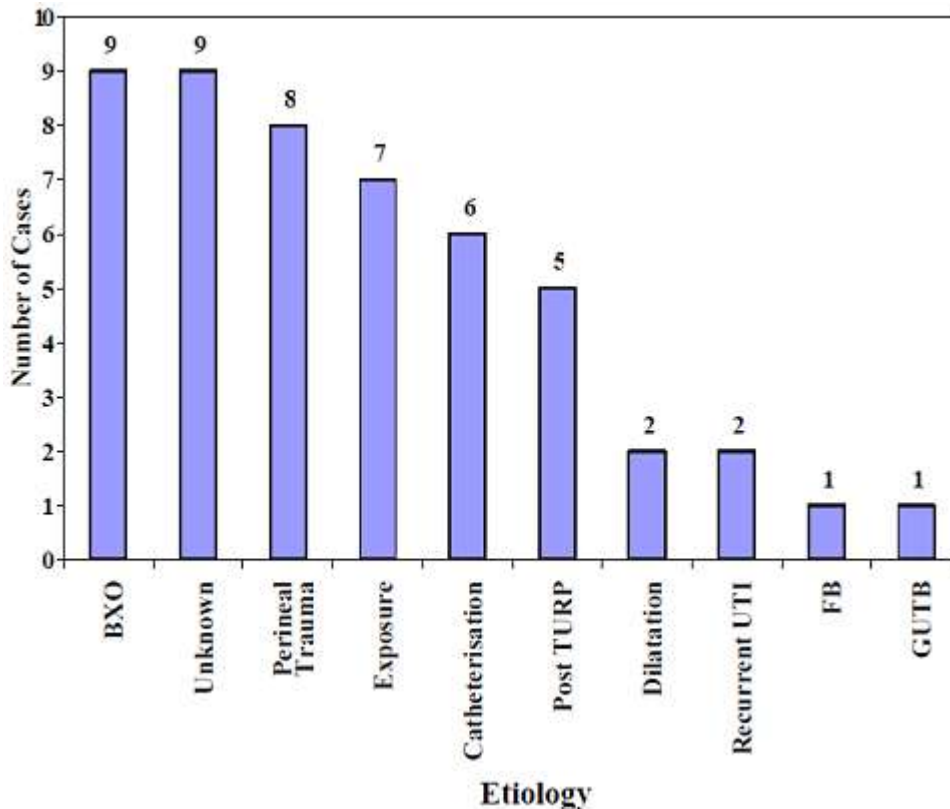
distal urethra. There was not much of a discrepancy between sonourethrogram and RGU. When there was 74% or more narrowing of urethral lumen outcome of VIU was poor. The degree of spongiofibrosis which could be identified only by sonourethrogram influenced therapeutic decisions. in 7% of cases. For example in one case RGU revealed a bulbar stricture with negligible proximal contrast entry. Sonourethrogram revealed severe spongiofibrosis evidenced by hyperhoic strictured segment with no appreciable lumen. Instead of trial UIV, anastamotic urethroplasty was done. Peroperatively the excised stricture segment showed near total occlusion of lumen with intraluminal and wall calcification.

All strictures diagnosed by RGU were detected by sonourethrogram also. Out of 50 cases 7 cases showed urethral dilatation proximal to stricture site detectable by both RGU and sonourethrogram. 2 cases had associated diverticulum with diverticular stones, picked up by both RGU and SU. The stones appeared as radiolucent filling defects in RGU and as well defined hyperechonic intraluminal lesion in SU. In RGU absent entry of contrast into posterior urethra may be due to sphincter spasm. It may not be possible to repeat the study due to the limited availability of contrast or fluoroscopy/overhead x-ray. Doubt may arise as to whether they are strictures or sphincter spasm in cases which do not demonstrate typical coming.

There were 2 such cases in our study. Which when evaluated by SU showed free flow of saline thro the suspected segment which showed no spongiofibrosis and corresponded to membranous urethra abutting the apex of prostate.

The posterior urethra was identified in most of the cases and movement of saline through posterior urethra and entry into the bladder as a jet was discernable in 40% of cases. Technical difficulties do exist in visualizing posterior urethra by transperineal sonar. TRUS would be ideal in men to visualize posterior urethra. In women the entire urethra can be visualised excellently by trans vaginal sonar. Doppler USG location of bulbar urethral arteries was done in 15 men with normal urethra and 15 men with urethral stricture. Contrary to the popular belief that bulbourethral arteries are located at 3 and 9 0' clock positions, we found that there was no predictable pattern for their anatomy in both normal men as well as in men with urethral stricture. But in normal men and symmetry of bulbourethral vessels was maintained, while in stricture cases there was loss of symmetry. In 2 cases of dense stricture they were identifiable on only one side. The distance of the vessel from the urethral lumen was found to be shorter in stricture cases. In normal urethras the average distance was 2.5mm while in stricture urethras it was 1.9mm. These observations might have implications in treating stricture disease with VIU, as they could help avoid injury to bulbourethral arteries.





5. Discussion

Sonourethrogram was positive in all cases in which RGU showed strictures, comparable to the study(1) conducted by Ravi Pushkarna, Satish K.Bhargava, Mukta Jain, ultrasonographic evaluation of abnormalities of the male anterior urethra. In penile urethral strictures there was no discrepancy in the length of stricture measured by RGU Vs SU. Similar to the study(2) by Nash, Peter A, MCAninch, Jack W., Bruce, Jeremy E., Hanks, Douglas K. Published in Journal of Urology 154(3) 72-76 July 1995. In bulbar stricture the SU measured length was more than RGU measurement length in 33 out of 45 cases (73%). The discrepant length varied between 2mm and 2cm similar to the study(16) by Nash, Peter A, MCAninch, Jack W., Bruce, Jeremy E., Hanks, Douglas K. Published in Journal of Urology Vol.154(3) 72-76 July 1995. Percentage narrowing of urethral lumen evaluated by RGU and SU showed not much of a difference and when the percentage narrowing was more than 74% VIU outcome was poor comparable to the study(14) conducted by Manhari, Anil, Chaudhury, Mimanshu, Kapoor, Rakesh, Srivastava, Aneesh, Dukey, Deepak, Kumar, Anant Journal of Urology 173(5) 1595-1597 May 2005.

Spongiofibrosis(4) can be detected only by S.U. Even small strictures that have no urodynamic effect can be detected by S.U. Periurethral cuffing is an indicator of poor VIU outcome. Conclusion of colour Doppler USG localisation of Bulbourethral arteries was comparable to that of the study(5) by Jhekka Adiyat Kishore, Suresh Bhat & Roy P.John - Colour Doppler USG location of the Bulbo urethral arteries and its impact on surgical outcome published in BJU vol 98 September 2005. Conclusion of the above study revealed that there was no predictable pattern for their anatomy. In

men with stricture disease there was loss of symmetry in all cases and the mean distance of the urethral artery. From the lumen urethra was 1.88 mm in stricture cases and 2.6mm in normal urethra. In our study in normal urethra the average distance was 2.5mm and in stricture cases it was 1.9mm.

6. Conclusion

We believe that sonourethrogram is a very useful modality in the evaluation of anterior urethral strictures. It is superior to retrograde urethrogram in stricture length and spongiofibrosis assessment, which aid in choosing the ideal therapeutic approach. By preoperatively identifying bulbar strictures too long for resection and end-end anastomosis, we may plan for flap or graft procedure. TRUS or trans vaginal sonar visualisation of urethra and bladder may play a major role in future in the evaluation of voiding dysfunction.

References

- [1] USG evaluation of abnormalities of the male anterior urethra Ravi Push Karna, Satish K.Bhargava Mukta Jain Indian Journal of Radiology Image 2000; 10: 2: 89-91.
- [2] Sonourethrography in the evaluation of anterior urethral stricture Journal of Urology 154 (1) 72-76 July 2005, Nash, Peter A. Jack W. Bruce, Jeremy E. Hanks, Douglas K.
- [3] Urology by John Blandy and Christopher Forwel 2nd edition chapter 32 Urethra and penis
- [4] McAninch JW, Laing FC, Jaffery B, Jr.; Sonourethrography in the evaluation of urethral stricture: a preliminary report, J Urol.1998; 139: 294-297.
- [5] Colour Doppler USG localisation of bulbo urethral artery, and its impact on surgical outcome. Thakke

- Adiyat Kishore, Suresh Bhat, Roy, P.John, BJU Vol.96, Sept. 2005.
- [6] Cluck CD, Bundy AL, Fine c, et al: Sonographic Urethrogram: comparison to roentgenographic techniques in 22 patients. J Urol.1988; 140: 1404-1408.
- [7] Edward M, Mullin Lloyd J, Paterson & David, Paulson F.Retrograde Urethrogram : diagnostic aid & hazard, J. Urol. 1973; 110: 464-466.
- [8] Heinenreich A, Derschum W, Bonfig R, Wilbert, D.M. Ultrasound in the evaluation of urethral stricture disease: a prospective study in 175 patients. British Journal of Urology. 1994; 74: 93-98.