“URETERIC CATHETERIZATIONS IN UROLOGICAL PROCEDURES, A MODIFIED METHODOLOGY.”

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“ABSTRACT” INTRODUCTION: Ureteric Catheterization is extensively used in various urological procedures. (I) Open classical surgical procedures: open stone surgery (OSS) etc. (II) PCNL, per-cutaneous nephrostomy (PCN), (III) ESWL: In large stone size, high-density cases, avoiding Stein-Strasse affecting procedures. (IV) Lap. uretero-lithotomy, endoscopy: retro-grade pyelo-graphy (RGP), uretero-reno-scropy (+) litholact etc. (V) Drainage procedures: external/internal, ureteric sampling, inf. localization.

AIMS/OBJECTIVES: Double-J-Stent/J-J Stent (DJS) are commonly available appliances in clinical practice, for ureteric patency achievement during different surgical procedures. Sometimes pigtail catheters are employed. This study deals with the successful use of commonly available infant feeding tubes (IFTs), no. 5/6 usually & sometimes no. 7/8, to achieve renal-vesical (R-V) patency during various surgical procedures involving pyelotomy, nephrotomy, calycotomy repairs, ureteric anastomosis etc.

METHODS: Successful use of infant feeding tubes, as ureteric patency catheterization, done in hundreds of patients undergoing pyeloplasty, pyelolithotomy, nephro-lithotomy, calyc-lo-lithotomy, uretero-lithotomy, lap. uretero-lithotomy, renal/ureteric tumor surgeries, ureteric strictures end-to-end anastomosis, ureteric trauma surgeries etc. After stone extraction, tumor/stricture excision, reconstructive repairs, appropriate size infant feeding tube obliquely cut at both the ends, is negotiated from pyelotomy/ureterotomy wound, first downward to U.B, confirmed by coming out of urine on suction with a syringe, & then the upper oblique end was gradually manipultated to renal pelvis or desired pelvicalyceal position. For maximal RV drainage, pyelotomy & ureterotomy wounds were meticulously secured with 5-0 sutures, avoiding subsequent narrowing, surgical wound closed in layers, with peri-renal/peri-uretic drain, had very small amount drainage, due to patent renal-vesical tract, allowing proper healing of pyelotomy/ureterotomy. The drainage becoming absolutely dry, in 2-3 days time, were removed.

RESULTS: The comparative evaluation assessments for use of DJS/infant feeding tubes, to achieve ureteric patency as described in above mentioned procedures, has been studied as: comparatively very low cost, yet easy availability of needed different calibres of IFTs, sterile packs. - Simplicity of insertion, placement, with ensured renal-vesical patency, avoiding hazards of comparatively much costlier DJS insertion & secured placement to UB below & kidney above, retaining proper curls & positioning, needing not readily available guide-wires etc. - The most important advantage of IFTs use, being their spontaneous passage with urine in about 4-5 days. Awareness patients are advised to pull out pouting tube through urethral orifice without getting panic. Spontaneous passage ratio being higher in female patients. Some females patients retained IFTs in UB, not able to pass per urethra, had been removed safely, with simple haemostat, under cautious radiological screening.

CONCLUSION: The alternative use of IFTs instead of DJS, can be advocated, as an accomplished modified methodology. As in described circumstances, with the advantages of comparative result, out comes, very low costs, avoiding hazards of availability, difficulty during insertion & placement needing added appliances for positioning & complete cystoscopy system with expertise, at the time of removal. However, for extensive urology, gynecological, pelvic surgeries, surgical oncology procedures, the available use of needed DJS/Pigtail catheters, is recommended.

KEY WORDS: Ureteric catheterizations, Ureteric stents, Stent symptoms, Ureteric calibration & patency maintenance, infant feeding tubes (IFTs) use comparative evaluation.

1. INTRODUCTION

Ureteric Catheterization is extensively used ‘manouvre’ in various urological procedures, with an aim to achieve:

1. Benign or malignant obstruction relief
2. Peri-operative placement for identification of ureters e.g. pelvic surgeries, alignement of drainage system, maintenance of luminal calibre & after ureteral interventions (URS) to avoid spasm with healing facilitation.
3. As an adjunct to stone surgery - for ESWL, intra-luminal lithotripsy, ureteral instrumentation & for stone visualization.
4. For urinary leak management – leak due to trauma or surgery, leak from ureteral fistula.

The various different applicability include -

(A) OPEN CLASSICAL SURGICAL PROCEDURES:

- Open stone surgery (OSS): Pyelo-Lithotomy, Nephro-Lithotomy, Uretero-Lithotomy
- PUJ Obstructions, Tumor surgeries resections

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DIFFERENTIAL URETERAL CATHETERIZATION TEST: Also K/A Differential Renal Function Test/Split Renal Function Test, Is Performed For Determination Of Various Functional Parameters Of One Kidney As Compared With The Contralateral Kidney. Ureteral Catheterizations Is Done By Cystoscopy In B/L Ureters Or Renal Pelvis. The Simultaneous Measurements Are Made Of Urine Flow Rate, Insulin, Or PAH (If Infused), Endogenous Creatinine, Or Various Urinary Solutes From B/L Urinary Systems.

2. AIMS/OBJECTIVES


The Present Study Deals With The SucessFul Use Of Commonly Available ‘Infant Feeding Tubes’ (IFT) No. 5/6 Usually & Sometimes No.7/8, TO Achieve Reno-Vesical(R-V) Patency, During Various Surgical Procedures Involving Pyelotomy, Nehrotomy, Calycotomy, Repairs, Ureteric Anastomosis Etc.

3. DISCUSSION


‘STENT’ INSERTION: After Proper Diagnosis(USG,CT/CECT,PyeloGraphy:IVU, Cystoscopy;RGP Etc.) With Completely Explained Procedural Details & Written Consent, Needed Part Preparation & AntiBiotic Coverage, Under Sedation/StandBy Anaesthesia/Anathestic Lubrication

Jelly/Local/Regional S.A/G.A, Compliant Patient In Lithotomy Position, Cysto-UrethroScopy Is Performed, With Available Or Fibre-Optic Flexible CystoScope, With Noted Comment Upon Ext. Urethral Orifice, Different Parts Of Urethra, Veru-Montanum, Prostatic Urethra, Prostatic Lobes ?EnlargeMent, Urinary Bladder Mucosal Status,

1. Double-J-Stent With Teether
2. Pig Tail & Other Catheters

Photograph 1


AFTERCARE: Includes Immediate Post-Operative Care(TAnaesthesia), Needed Medications(Antibiotics, Analgesics Etc.), Control X-Ray KUB For Proper Positioning With Periodic CheckUps & Needed Management.


SIDE EFFECTS & COMPLICATIONS: [56,57,58,59,60,61] Main Complications -
Dislocation, Infection And Blockage By Encrustation. 
Recently Stents With Coatings Eg Heparin, Are Approved To Reduce Infection, Encrustation & To Reduce Stent Exchanges Frequency.

Other Complications - Increased Urgency And Frequency Of Urination, Leakage Of Urine, Haematuria, Pain In The Kidney, Bladder, Or Groin, Especially After Urination. These Symptoms Are Generally Temporary And Disappear With Stent Removal.

Various Recommended Medications Are Of Significant Help. [77,78,79,80,81,82,83,84,85,86]
Incontinence, Vesico-Ureteric Reflux, Pyuria, Fractured, Forgotten Stent & Ureteral Erosion & Fistulization Are Known Complications.

In ‘Threaded Stents’- Urethral Irritation Occurrence, Especially Hypospadias Or Other Conditions Needing Similar Corrective Surgery, Needs Cautious Thread Care & ‘Stent Removal’ To Avoid Dislodgement.

With Properly Placed Stent In-Situ, Most Normal Activities Are Not Affected, However Some Discomfort During Strenuous Physical Activity May Occur.

Almost Normal Sexual Activity Can Be Achieved In Patients With Stent, Exercising Cautious Different Sexual Approach & Certain Barrier Contraception Use.

With ‘Threaded Stents’ Significant Hindrance Of Sex Is Reported.

Due To Prostate Gland Movement, With Overlying Stent, Severe Cramping, Irritation Or Discomfort During Ejaculation/Orgasm May Occur.


IDEAL ‘URETERAL STENT’ DESIGN

Standardized Softness Of Silicone Material Negated By High Coefficient Of Friction Of Silicone, Initiated Use Of Polyethylene, But Urinary Environment Unstability Leading To Fracture Stents Etc.

Polyurethane Was Substituted & Continued To Be Used In Stent Construction, Either Alone Or In Combination With Other Materials. [35,50,51,52,53,54,55]
More Recently, Copolymers Such As C-Flex (Concept Polymer Technologies, Clearwater, FLA), Percuflex (Boston Scientific, Natick, Mass), And Flexima (Boston Scientific) Have Been Used In The Construction Of Double-J Or Double-Pigtail Catheters. [62,63,64,65]

Hydrophilic Gel Coatings Are Added To Assist Placement And Reduce Encrustation And Complicating Infection. [74,75,76]

Biodegradable Materials And Metal Stents, Are In Study Process. [66,67,68,69,70]

Indwelling Time (Time A Stent Is In-Situ Position), Is Usually Determined By Placement Indication Combined With Physician Experience & Range From A Few Days For Relief Of Ureteral Edema To Life Long Duration, For Ureteral Patency Maintenance In Malignant Diseases. Regardless Of The Stent Composition, Usual Recommendations Are For ‘Stents Exchange’ At 3- To 6-Month Intervals, While Increased Prevalence Of Complications With Longer Indwelling Times Is Reported. [71,72,73]

‘Case Western Reserve University’, Recorded Coding For Kidney, Ureter And Bladder Procedures Medical Terminologies, Includes Ureteral Stenting Codes: Pertinent Ureteral Tailoring Codes With Codes For Cystoscopy, Pyeloplasty (Foley Y-Pyeloplasty), Plastic Operation On Ureter, Nephropexy, Nephrostomy, Pyelotomy, Or Ureteral Splinting, Simple Pyeloplasty Complicated (Congenital Kidney Abnormality, Secondary Pyeloplasty, Solitary Kidney, Calycoplasty) & Others.

3. METHODS

‘IFT’ INSERTION TECHNIQUE:
After Stone Extraction, Tumor/Stricture Excision, Reconstructive Repair

- Appropriate Size Infant Feeding Tube ‘Obliquely Cut’ At Both The Ends, Is Negotiated From ‘Pyelotomy’/ ‘Ureterotomy’ Wounds
- First Downwards To U.B, Confirmed By Coming Out Of Urine On Suction With A Syringe
- Then The Upper Oblique End: Gradually Manipulated To Renal Pelvis Or Desired Pelvicalyceal Position

Photograph 2

Cas.png

Photograph 2

IJSER
INFANT FEEDING TUBES (IFTs) No. 5, 6 & 10

FOR MAXIMAL RENO-VESTICAL DRAINAGE:

- Pyelotomy & Ureterotomy Wounds, Were, Meticulously Secured With Discrete 3-0 Sutures, Avoiding Subsequent Narrowing.


RESULTS

The ‘Comparative Evaluation Assessments’, For Use Of ‘DJS’ & ‘Infant Feeding Tubes (IFTs)’, To Achieve Ureteric Patency As Described In Above Mentioned Procedures, Has Been Studied As: Comparatively Very Low Cost, Yet Easy Availability, Of Needed Different Calibres Of IFTs, In Sterile Packs.


At Ease, Spontaneous Passage With Urine, In About A Weeks Time, Being The Most Important Advantage Of IFTs Use, Successfuly Recorded, In About More Then 90-95% Cases.

PROCESS OF SPONTANEOUS PASSAGE OF IFTs

SomeTimes Advised Aware Patients Are Needed To Pull Out Pouting Tube Through Urethral Orifice Without Getting Panicky. Spontaneous Passage Ratio Is Higher In Female Patients.

OTHER SIDE-EFFECTS / COMPLICATIONS OF URETHRAL STENTING: Stent Symptoms; Pain, LUTS, Dysuria, Haematuria, Back Pain, UTI. Incorrect Placement, Migration, Stent Blockage, Forgotten Stent Etc, Can Be Cautiously Avoided By Secured Adherence, To Proper Asepsis, IFTs Procedural Technique, & Compliance Etc.

REMOVAL OF RETAINED ‘IFT’ IN FEMALE U.B

In Some Females Patients Retained IFTs In U.B, Not Able To Pass Per Urethra, Had Been Removed Safely, With Simple Haemostat, Under Cautious Radiological Screening.
5. CONCLUSION
The Alternative Use Of IFTs Instead Of DJS, Can Be Advocated, As An Accomplished ‘Modified Methodology’, Especially In Limited Resources Availability Circumstances. With “Secured Comparative Result Out Comes”, The Advantages Include:

- Very Low Costs, Easy Availability Of Different Calibres, In ‘Sterile’ Packing.
- Simple, Safe Procedural Benefits, Avoiding Hazards Of Availability, Difficulty During Insertion & Proper Placement; Positioning In-Situ.
- Avoidance Of Need For Complete ‘Cystoscopy System’ With Expertise, At The Time Of Removal.

HowEver For Extensive Urology, Gynaceological, Pelvic Surgeries, Involving Ureteric Delineation, Reconstructive Repairs, Surgical Oncology Procedures, The Available Use Of Needed DJS/PigTail Catheters, Is Recommended.

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7. REFERENCES


