Clinical Article Summary

Characteristics of Encrustation of Ureteric Stents in Patients with Urinary Stones

The prospective study analyzes several factors that may impact the nature of ureteral stent encrustations. The study also assesses the level of encrustation for two stent materials, polyurethane and silicone, with no differences in the gender, age, and indwelling time.

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Abstract

Purpose: Prospective study on the nature of ureteric stent encrustations in stone-forming patients according to the gender and age of patients and the indwelling time.

Materials and Methods: 658 ureteric stents from 412 men and 246 women with urinary stones, average age 48.2 ± 16 years, were included in the study. Encrustations at different levels of each stent were examined by infrared spectrophotometry. The results are presented in relation to the primary component.

Results: The average indwelling time of the stents was 73.5 ± 73.2 days. Calcium oxalate, the most frequently observed component (43.8%), was essentially present in monohydrate form (27.1%), followed by proteins (27.4%), calcium phosphates (16.4% including 8.4% brushite) and uric acid (5.2%). Struvite, detected in 49 stents, was the primary component in 2.9% of the cases. Significant differences were observed according to the age and gender of patients: whewellite in men increased from 24.5% before the age of 30 to 37.0% between the ages of 50 and 59, before decreasing. Weddellite increased up to the age of 70 in women, while it fell sharply after the age of 50 in men. Brushite was abundant in young men (20.4% before the age of 30), but remained stable with age in women. Uric acid increased sharply in men over 70 (20.0% versus 4.1% before the age of 30) and more moderately so in women. Most mineral encrustations increased with indwelling time to the detriment of the protein network, and became predominant after 15 days of implantation. Forty-three stents (7.3%) contained actual calculi. Their average indwelling time in the urinary tract was 113 days. A comparison between materials revealed that silicone stents were significantly less affected by encrustation than polyurethane stents.

Conclusion: Encrustation is a serious complication of ureteric stents in stone-forming patients. Encrustation could be prevented or its scale could be reduced by considering the patients' lithogenic risk factors.

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Coloplast Key Takeaways

- The study results determined that the level of organic encrustation (biofilm) was approximately 20% lower for silicone stents compared to polyurethane stents, with no difference in terms of patient gender and age, indwelling time, or the nature of the encrustations.
- The study results determined that the level of mineral encrustation (calcium phosphates) was approximately 34% lower for silicone stents compared to polyurethane stents, with no difference in terms of patient gender and age, indwelling time, or the nature of the encrustations.
- The study demonstrated that encrustation is less abundant with silicone stents as compared to polyurethane stents. As such, the study authors believe that the stent material plays a major role in the risk of encrustation.

ImaJin® Silicone Hydrocoated Double Loop Ureteral Stent Kit

Indications
Silicone Hydro-Coated Double Loop Ureteral Stents are intended for:
- Drainage of the upper urinary tract over fistulas or ureteral obstacles
- Healing of the Ureter.

Contraindications
Untreated progressive infection of the upper urinary tract.

The evaluation of the allergic background of a patient is the healthcare professional's responsibility.

Do not attempt stent placement in a patient with suspect ureteral avulsion.

Do not use, when, in the judgement of the physician, such a procedure would be contrary to the best interest of the patient.

Warnings and Precautions
These kits must only be used by trained and experienced physicians. Formation of knots in lengthy stents have been reported as adverse events and may require surgical intervention to remove them.

Potential Complications

The following events have been reported although their occurrence greatly depends on patients' medical conditions. Adverse events include but are not limited to: migration or dislodgement, encrustation, infection, fragmentation, flank pain, mucosal irritation or inflammation, mucus secretion, frequency, urgency, dysuria, hematuria, reflux, stone formation, obstruction, erosion and perforation of the renal pelvis, ureter or bladder. Some events may be related to this procedure, amongst which those related to the guidewire: ureteral perforation, or burns when in contact with an electrosurgical equipment.

Advice to the Patients

The physician should educate the patients on their implanted stent, potential side effects and the need for regular monitoring.

The information provided is not comprehensive with regard to product risks. For a comprehensive listing of indications, contraindications, warnings, precautions, and adverse events refer to the product's Instructions for Use. Alternatively, you may contact a Coloplast representative at 1-800-258-3476 and/or visit the company website at www.coloplast.com.

Caution: Federal law (USA) restricts this device to sale by or on the order of a physician.

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