

New classification of iatrogenic thermal damage to the ureter: early detection and therapy to avoid severe secondary complications

Joerg Neymeyer, Katharina-Sophie Mala, Sultan Alburayk, Viktoria Schaeff and Thorsten Schlomm

Introduction: Iatrogenic thermal damage to the urogenital tract, particularly the ureter and bladder, is a common complication following surgical and gynaecological procedures. Early recognition and adequate treatment of these complications are crucial to prevent secondary complications that are difficult or impossible to treat.

Materials and methods: In this study, a total of 296 thermal injuries were diagnosed and treated at an early stage between 2010 and 2025. Diagnostics included imaging procedures such as CT and ultrasound as well as the analysis of creatinine from drainage tubes to identify fistulas and urinomas. A fully sheathed, sealing stent (Allium URS 200x9mm or 120x10mm) was inserted endoscopically in a minimally invasive procedure.

Results: Between 01/2011-02/2025, ureteral lesions/ureteral fistulas (n=296; women n=226; men n= 66) of which partial ureteral lesions (n=212) and complete ureteral defects (n=84) were treated. 242 ureteral lesions were thermal. Thermal damage could be categorised into three groups: 1) early complications (0-3 days), 2) mid-term complications (4-28 days) and 3) late complications (> 29 days). Early and mid-term complications could be treated with minimal complications using minimally invasive procedures with a fully covered stent. If a stable fistula tract with urothelial covering has formed, classic fistula repair procedures are necessary in 38% of cases. Ureteral defects healed after insertion of a fully covered stent in partial ureteral defects in 91% and in complete ureteral defects in 79% without follow-up interventions. Interpretation of results: Urothelialisation of the fistula tract can be avoided by early detection and treatment of the ureteral lesion by inserting a full-cover stent. This significantly improves the healing process without subsequent interventions.

Conclusion: The fully covered stent is minimally invasive and easy to insert endoscopically. Early detection and treatment of ureteral damage leads to faster convalescence and reduces the risk of secondary complications that are difficult to treat. The new classification provides a valuable basis for clinical practice and the improvement of patient care.



Training Programme
"Pelvic Floor Surgeon"
STIFTUNG CHARITÉ

Classification of iatrogenic ureteral complications due to thermal damage

Thermal damage (TD)

- Acute thermal damage (ATD);
0-3 days- necrosis and fistula formation
- Short-term thermal damage (STD);
4-28 days- necrosis and fistula formation
- Long-term thermal damage (LTD);
> 29 days stricture, necrosis and fistula formation

