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URETERAL INJURIES IN COLORECTAL SURGERY: AN ANALYSIS OF TRENDS, OUTCOMES AND RISK FACTORS OVER A 10-YEAR PERIOD IN THE UNITED STATES.

(3)

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Purpose: Iatrogenic ureteral injuries during colorectal surgical procedures are rare. Little is known about the true incidence of these injuries, the outcomes associated with them, and the predisposing risk factors.

Methods: The Nationwide Inpatient Sample (NIS) database was retrospectively reviewed from 2001 to 2010 for iatrogenic ureteral injuries occurring in procedures performed for colon and rectal cancer, polyps, inflammatory bowel and diverticular disease. Trends were examined and outcomes were compared using multivariate regression analysis. The LASSO algorithm for logistic regression was used to build a predictive model based on the following: patient factors, hospital status, admission type, disease type, procedure type and the use of laparoscopy.

Results: In 10 years, a total of 1,494,041 colorectal surgical procedures were performed in the United States and 4,088 iatrogenic ureteral injuries occurred (0.27%). The rate of ureteral injuries was higher in the 2007-2010 period (3.3/1,000) compared to the 2001-2006 period (2.3/1000) ($p < 0.001$). Ureteral injuries were independently associated with higher mortality (aOR=1.75; $p < 0.01$), higher morbidity (aOR=1.46; $p < 0.001$), longer hospital stay by 3.46 days ($p < 0.001$) and hospital charges that were 31,205 US\$ higher ($p < 0.001$). The LASSO algorithm identified rectal cancer as the strongest predictor for injury (OR=1.84) followed by the presence of metastatic cancer (OR=1.46) and adhesions (OR=1.16). Age, gender, use of laparoscopy, hospital status, emergent cases and inflammatory bowel disease were not identified as risk factors. Right sided colonic resections appeared to be the least prone to ureteral injuries compared to all other procedures

Conclusions: This is the largest study to date on iatrogenic ureteral injury demonstrating an increasing incidence of this complication. Ureteral injuries are associated with higher mortality, morbidity, hospital charge and length of stay. Their incidence appears more frequent in the presence of adhesions, rectal cancer and advanced cancer.