

Gastrointestinal sutureless anastomosis using fibrin glue: Reinforcement of the sliding absorbable intraluminal nontoxic stent and development of a stent placement device.

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Abstract:

Sutureless anastomosis of the gastrointestinal tract using fibrin glue and sliding absorbable intraluminal nontoxic stents (SAINTs) has two shortcomings, stent shaft breakage and the lack of a transanal insertion device (TID) for low anterior resection. Reinforcement of the sucrose base SAINT (R SAINT) is described. Sutureless anastomosis is attempted using a stapleless mechanical stapler (SS) and used as preprototype to screen histologically and mechanically for TID anastomoses in the small intestine. Finally, a prototype absorbable head SAINT placement device (SAINT-PD) intended for TID, similar to the SS, is utilized on the small intestine. Fifty-seven Landrace pigs weighing 25-35 kg were used to perform 58 anastomoses, including the small intestine (15 manual, 19 SAINT, 11 SS, 5 R-SAINT, 6 SAINT-PD) and large intestine (2 R-SAINT). All anastomoses performed with the R-SAINT succeeded on the first attempt even if the shaft cracked. The SS technique proved impractical, but the histological screen results from 7 to 60 days did approximate those of corresponding SAINT anastomoses. The SAINT-PD demonstrated operational improvement over the SS, but the histological results were similar to both the SS and SAINT. The advantages of the R-SAINT and SAINT-PD are that they leave no foreign bodies or pressure clamping devices at the anastomotic site. Larger studies may show the R-SAINT and the SAINT-PD to be practical, new surgical tools in sutureless fibrin glue anastomosis.