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Design and application of multifunctional stomach clamp

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Abstract

AIM: Pylorus and pyloric vagus preserving gastrectomy (PPVPG) is an efficient operation mode for treating gastric and duodenal ulcers. For its better application and popularization, we have designed and manufactured a special multifunctional stomach clamp.

METHODS: The clamp has been designed carefully in view of the different sizes of the patients' stomachs and the different starting points of Latarjer nerves so as to facilitate the execution of the present operation mode, which requires the preservation of the vagus innervated pyloric region so as to make the remnant stomach maintain its normal physiological function and the vagus branches clinging antral seromuscular flap kept in proper size so that avoiding too much remaining antral mucosa is removed to cause greater difficulty in operation. With this in view, we observed and measured the distance between the Latarjer nerves distribution and the pyloric rings of 42 patients' stomachs in the course of operations. We bent an aluminum string 3 mm thick for each stomach according to the size of antral seromuscular flap and chose an optimal curvature from the 42 sizes for manufacturing the clamp. The clamp is made of 3 Cr13 stainless steel, consisting of three parts, the curved head, the fastening ring and the handle. The curved head is shaped almost exactly like the remained antral seromuscular flap. The ring at its tip when in place fastens the two sides of the clamp so that the tissue of the stomach between will be clutched by an even force. On one side are three cuts for moving the ring upwards, each cut representing 1 mm for fastening and adjustments can be made in view of the thickness or thinness of the tissue. The handles bend backward for fighting shy of the cuts so as to facilitate the operation.

RESULTS: With the stomach disassociated in the light of PPVPG procedures, the clamp may easily be applied from the upper part of the Latarjer nerves. The following merits can be noted. (1) The curving line of the flap can be precisely cut. (2) Before the antrum mucosa is stripped, the submucosal injection of hemostatic salt solution can be confined without being expanded and the solution will separate muscular layer from mucous layer and helpful in stripping. (3) The bleeding of the cuts on the antral seromuscular layer being clamped and stopped. (4) The antral seromuscular flap shaped by the clamp and facilitated to strip the antrum mucosa beneath. (5) The gastric juice can be prevented from flowing to the stripped region. All these evidently facilitates the operation and shorten the time consumed. By the adjustment of its position in the operation the clamp can be applied to stomachs in different size or with different starting points of Latarjer nerves and even to those of experimental animal. Apart from applying to PPVPG, the clamp can be used for the following operations: the Bancroft operation, with the curved part directing upwards; the resection of gastric ulcer at the high portion of the stomach; the Billroth Ⅱ anastomosis. The clamp has proved in good performance for 122 cases of clinical treatment, worthy to be recommended to our colleagues.

CONCLUSION: The clamp can be used not only for this operation mode, but also for Bancroft operation, for the resection of gastric ulcer at the proximal end of the stomach and the Billroth Ⅱ anastomosis hence named the multifunctional stomach clamp.

Key words: Stomach clamp

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