

A new surgical tool facilitating the low colo-rectal anastomosis. The original "grasping tie"



Ann. Ital. Chir., LXXV, 2, 2004

N. Picardi

Università degli Studi "G. d'Annunzio" di Chieti
Department of Experimental and Clinical Surgical Science
SS. Annunziata Clinical Hospital
I Division of General Surgery
Head: Nicola Picardi, M.D. Professor of Surgery

Introduction

A new surgical tool has been designed to facilitate the stapled low colo-rectal anastomosis in alternative of the Knight-Griffen procedure. Its function is to substitute the customary purse string in fixing on the axle of a stapler anvil introduced in the anus the low rectal stump. For an adequate description of its function the tool has been named *grasping tie*. In fact it grasps by means of a nylon ribbon fashioned in slipping knot the rectal stump around the extruded axle of the anvil of a circular stapler introduced in the anus. The ribbon is progressively tightened from the outside on the axle by the tool itself, driving far from the operating tip two levers on the handle.

The need to fix on the anvil of a circular stapler a rectal stump with a purse string suture in the preparation of the mechanical anastomosis is very often hastened by the narrowness on the space deeply in the pelvis. Therefore it is sometimes difficult to perform the low rectal anastomosis, also with the Knight-Griffen procedure, especially in the presence of an often bulking sigmoid or rectal tumour.

Description Of The Tool

In its last prototype the *grasping tie* is shaped like a

Riassunto

UN NUOVO STRUMENTO CHIRURGICO PER FACILITARE L'ANASTOMOSI COLO-RETTALE BASSA. IL "GRASPING TIE" ORIGINALE

La funzione del grasping tie, nuovo strumento chirurgico, è alternativa ai metodi classici usati per fissare il moncone rettale all'asse di una suturatrice meccanica circolare per confezionare un'anastomosi meccanica nella profondità della pelvi. Pertanto esso sostituisce la sutura con borsa di tabacco, non sempre facile a realizzarsi nello spazio ristretto della pelvi a livello degli elevatori dell'ano. Il vantaggio del suo uso, a confronto con lo strumento purse string per sutura automatica o con il classico rastrello, è il minimo spazio operativo che esso richiede in situazioni anatomiche critiche, come per fissare il basso retto all'asse di una suturatrice circolare, introdotta preventivamente nel canale anale, e quindi fatta fuoriuscire.

Parole chiave: Anastomosi rettale bassa, anastomosi colo-rettale, resezione anteriore del retto, grasping tie, cancro del retto.

Abstract

A new surgical tool is here proposed to be used together with a circular stapler to help performing a mechanical anastomosis of the low rectum after a sigma or rectum resection. Its name, grasping tie, indicates its main function to fix from outside the rectal stump to the axle of the stapler anvil by means of a nylon ribbon slipping knot before the connection of the two parts of the stapler.

The small dimensions of the operative end of the tool make easy to operate in the narrow space of the deep pelvis.

Key words: Grasping tie, purse string, stapler, automatic anastomoses, low rectal resection.

pistol, with an handle with two levers and a rather long operating barrel at the end of which there is the original mechanism to pull the nylon ribbon (Fig. 1).

At the operative end of the barrel of the *grasping tie* there is a split for the introduction of the tail of nylon ribbon, fashioned in loop around the gut. The original



Fig. 1: The last prototype of the *grasping tie* in its external shape.

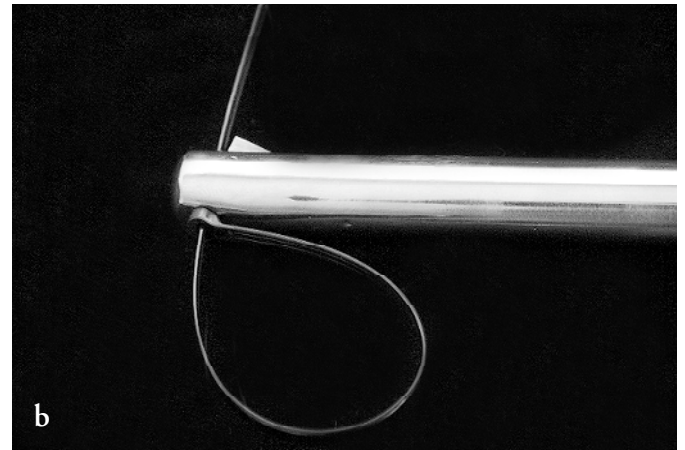


Fig. 2: Handle (a) and operative tip (b) of the *grasping tie*.

mechanism is aimed to the advancement of the ribbon tail, its tightening in slipping knot and the cutting of the tail in excess at the end of the procedure.

The entire mechanism is driven by two levers (Fig. 2, a) on the handle of the tool. The longer of them will progressively tightens the nylon slipping knot (Fig. 2, b) by means of repetitive movements. The shorter one is a true trigger that cuts the tail in excess of the tightened slipping knot when the firm fixation has been completed.

The entire procedure is as follows.

In the case of a low rectal resection, once freed the left colon, sigma and rectum till the elevators muscles plan, the nylon ribbon of the *grasping tie* is fashioned in a large loop around the rectum and its free tail is introduced in the split at the tip of the tool. The still loose loop is easily drawn down with the "grasping tie" till the level of elevator muscles plan, where the fixation is needed.

Preliminarily, if the stapler has been introduced in the

anus and then the axle completely withdrawn by the screw, one can palpate from the outside the axle itself, and repetitively moving the longer lever of the *grasping tie* handle, the ribbon tie is tightened till the complete fixation of the rectal stump on the axle itself, and in the right position.

Now with the blade lever the ribbon is cut close to the stop mechanism of the slipping knot itself, the gut is resected, making free the proximal stump with the tumour. To perform the mechanical anastomosis the head of the stapler, fixed as usual by a normal purse string in the proximal colon stump is brought down and connected to the anvil axle. The stapler is activated and fired to complete the anastomosis.

With the cutting mechanism of the stapler the two muscular mucous rings of the anastomosis are separated, containing over the lower of them all the tightening nylon tie. In this way the anastomosis can be completed operating from far from the narrow site of the anastomosis itself.

Clinical Experience

The *grasping tie* has been effectively used in the low rectum resection with success. The clinical experience is at

the moment not yet wide, but substantially positive. Here it is reported only with intraoperative demonstrative pictures .

Fig. 3 – a, b, c, d, e, f – The following series shows

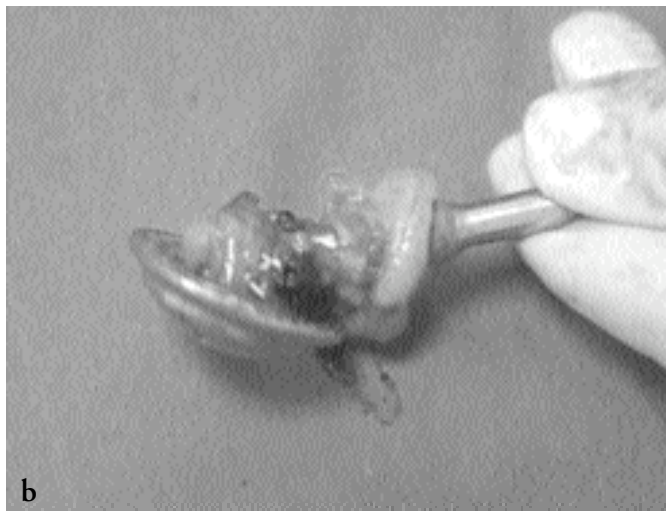
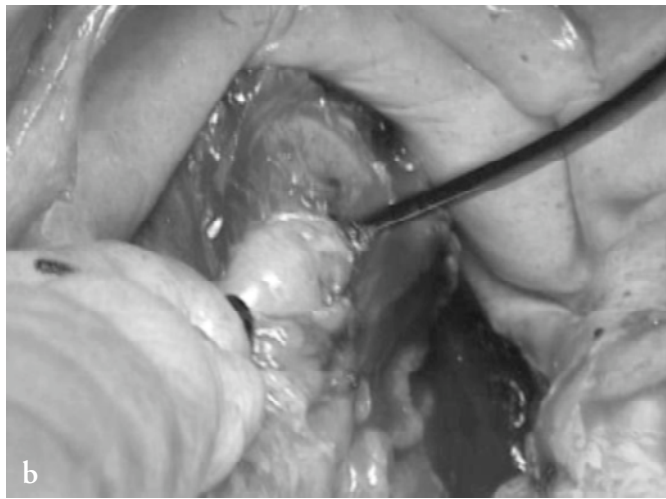
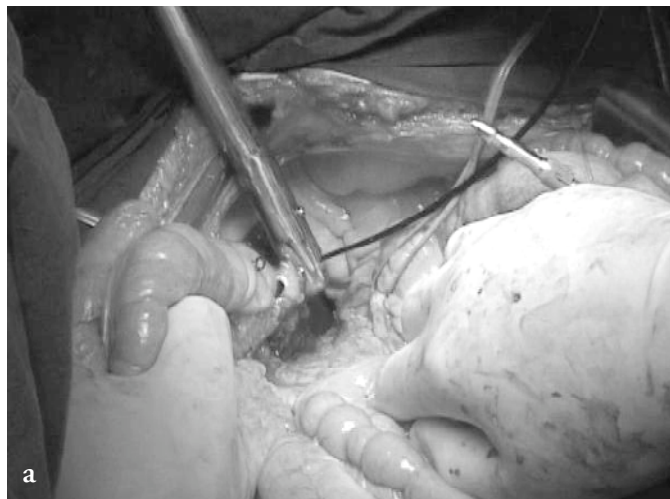


Fig. 3.

the use of *grasping tie* while fixing the rectal stump to the anvil axle of a stapler introduced through the anus in the final steps of a low rectal resection. a) the *tie* is tightened around the anvil axle to fix on it the rectal stump; b) the fixation is completed; c) the rectum is then resected while the lower rectal stump is firmly fixed to the stapler axle; d) the two parts of the stapler are connected; e) the closed stapler is fired; f) demonstration of the *tie* ring on the lower musculo-mucous ring after withdrawal of the stapler from the rectal side.

Results and Discussion

The tool has been repeatedly used for sigma and low rectal resection, following some preliminary attempts of ileo-transverse anastomoses after right colon resections performed as a safety test in the open abdomen. The advantages in the use of the tool are confirmed with satisfaction for the very little encumbrance of the operating tip, that can easily overcome the difficulties of the narrowness of the operative field in the deep pelvis.

The alternative and current methods to do the same step of the operation is to make a purse string by means of the current techniques. That is by the steel rake or by an automatic purse string device, or – in case of the rectal stump – adopting the Knight & Griffen technique or a manual running suture.

The preparation of the usual purse string by a rake-clamp or by the automatic purse string device is indeed unsure, risky or very difficult mainly for the dimensions of both these tools. The use of the first of them requires a doubled room in respect of the rake's width, to permit the introduction of the two long needles, but in an often too narrow deep operative field.

Also the suture obtained with the automatic purse string device is sometimes precarious and not completely reliable. Sometimes the same suture slips away while knotting the threads, obliging the surgeon to repair with a running manual purse string on the free margin of the stump, and every surgeon is aware that this is not so easy, because of the position of the rectal stump deep behind the bladder or the vagina of the patient.

The *grasping tie* tool can make easy the same purpose of fixing the rectal stump on the axle of the anvil of a circular stapler, with an easy manoeuvre from the handle of the tool and far from the point of apposition of the nylon tie. The nylon loop still opened can be driven easily down to the right point and then tightened before the gut section, so reducing the difficulties of operating in a narrow space thanks to the reduced dimensions of the barrel of the tool and helping with a traction on the sigma.

The experience on the operative field of the *grasping tie* demonstrates its utility and the sure advantages of its use in the described situation.

Conclusions

Every surgeon is well aware of the difficulties he encounters when he makes such anastomoses in the remembered difficult circumstances.

The main advantage in the use of the *grasping tie* in performing a low rectal anastomosis after a resection is the very limited dimensions of the operative end of the tool, that can easily drive the nylon slipping knot on the right point, descending deeply in the pelvis and grasp on the anvil axis from far the rectal stump, in the preparation of a mechanical anastomosis in the procedure for a low rectal resection.

At the moment the instrument is only a prototype and therefore its diffusion is still absent. However the interest of the participants of many congresses should be translated in that of the stapler industry, that can make its diffusion worldwide. A wider diffusion of the tool can confirm in the hands of more surgeons its usefulness.

Bibliography

- 1) Picardi N.: *Storia della sutura con dispositivi meccanici nella chirurgia dell'apparato digerente*. Ann Ital Chir, 2002, 73/1, 1-10.
- 2) Picardi N.: *Il grasping tie. I. Nota tecnica preliminare e presentazione di un nuovo strumento meccanico alternativo della borsa di tabacco*. Ann Ital Chir, 2002, 73/5, 525-531.
- 3) Picardi N.: *Simulated use of the "Grasping Tie" as for colo-rectostomy after a low rectal resection*. Ann Ital Chir, 2003, 74/1, 109-114.
- 4) Picardi N.: *Uso simulato del "Grasping Tie" come per esofago-digiunostomia dopo gastrectomia totale*. Ann Ital Chir, 2003, 74/2, 183-187.
- 5) Picardi N., Vene M., Visini R.: *Aggiornamento critico della tecnica del "no-touch" per il cancro del colon con l'uso del "Grasping Tie"*. Ann Ital Chir, 2003, 74/4, 469-476.
- 6) Picardi N., Pescatori M.: *The original "Grasping Tie". A technical possibility as an aid in the low colon-rectum mechanical anastomosis*. Techn Colopr (in press).

Autore corrispondente:

Prof. Nicola PICARDI
Via Montevideo, 6
00198 ROMA
E-mail: picardi@unich.it