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Endoscopic resection for superficial colorectal neoplasia in Italy: A prospective multicentre study

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ABSTRACT

Background: Since there are few prospective studies on colorectal endoscopic resection to date, we aimed to prospectively assess safety and efficacy of endoscopic resection in a cohort of Italian patients.
Methods: Prospective multicentre assessment of resection of sessile polyps or non-polypoid lesions ≥ 10 mm in size or smaller (if depressed). Outcome measures included complete excision, morbidity, mortality, and residual/recurrence at 12 months.
Results: Overall, 1012 resections in 928 patients were analysed (62.4% sessile polyps, 28.8% laterally spreading tumours, 8.7% depressed non-polypoid lesions). Lesions were prevalent in the proximal colon. *Enbloc* resection was possible in 715/1012 cases (70.7%), whereas *piecemeal* resection was required in 297 (29.3%). Endoscopically complete excision was achieved in 866 cases (85.6%). Adverse events occurred in 83 (8.2%), and no deaths occurred. Independent predictors of 12-month residual/recurrence were the location of the lesion in the proximal colon (OR 2.22 [95% CI 1.16–4.26]; $p = 0.015$) and piecemeal endoscopic resection (OR 2.76 [95% CI 1.56–4.87]; $p = 0.0005$). Limitations of the study were: potential expertise bias, no data on eligible and potentially resectable excluded lesions, high percentage of lesions < 20 mm, follow-up limited to 1 year.
Conclusion: In this registry study the endoscopic resection of colorectal lesions was safe and achieved high rates of long-term endoscopic clearance.

1. Introduction

Colorectal cancer is one of the leading causes of cancer death in Europe and the United States [1,2]. Endoscopic resection (ER) is a minimally invasive alternative to surgery for the removal of superficial neoplastic lesions in the colorectum, i.e. those lesions confined to the mucosa or to the upper third of the submucosa. These lesions have a negligible risk of lymph node metastases and are therefore amenable to curative ER [3,4]. Unlike pedunculated polyps, larger sessile or non-polypoid lesions (NPL) can be challenging to remove endoscopically. Most of the data regarding outcomes of ER in the colon come from Japanese series [5–11], though a number of Western studies have recently been published [12–15]. Unfortunately, only scant data are available for the Italian population [16–20].

Peculiar to the present study is the use of a simplified terminology (i.e. endoscopic resection) to describe different technical variants of a single procedure, which is the deliberate attempt of removing mucosa and submucosa down to the level of the muscularis propria [21]. This unifying term incorporates all means of previous different terminologies, from polypectomy to mucosectomy to submucosal dissection, since all these merely represent diverse technical modalities of performance of the same procedure necessary to remove large, sessile, or other high-risk lesions [22].

Objective of the study was to provide a real-life picture of ER for superficial colorectal neoplasia, assessing safety and efficacy in a large prospective cohort of patients in Italy. Secondary aim was to collect data to create a National Registry on colorectal ER.

2. Methods

2.1. Study design, setting, and patients

The Italian Colorectal Endoscopic Resection (ICER) study group is a collaborative initiative developed under the auspices of the

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Table 1
Clinical and endoscopic characteristics of the ICER study population.

	N. (%)
Total n. of patients	928
Males	544 (58.6)
Mean age (SD) years	66.0 (10.6)
Use of antiplatelet medications	161 (17.3)
Use of anticoagulants	29 (3.1)
Total n. of lesions resected	1012
Sessile polyps	632 (62.5)
Granular-type laterally spreading tumour	221 (21.8)
Non granular-type laterally spreading tumour	71 (7.0)
Depressed non polypoid lesions (0-IIc or 0-IIa + 0-IIc)	88 (8.7)
Location of lesions (proximal colon/distal colon/rectum)	
Non polypoid lesions	57/22/9
Sessile polyps	308/205/119
Laterally spreading tumours	203/49/40
Size of lesions	
Depressed non polypoid lesions (N = 88)	
<10 mm	88 (100)
Sessile polyps (N = 632)	
10–20 mm	391 (61.8)
21–30 mm	126 (19.9)
>30 mm	115 (18.2)
Laterally spreading tumours (N = 292)	
10–20 mm	145 (49.6)
21–30 mm	83 (28.4)
>30 mm	64 (21.9)

Non polypoid lesions were by definition less than 10 mm in diameter, otherwise they would have been categorized as laterally spreading tumour.
67 patients (7.2%) had multiple lesions: 58 patients had 2 lesions, 7 patients had 3 lesions, 1 patient had 6 lesions and 1 patient had 7 lesions.

Table 2
Technical details of colorectal endoscopic resection (N = 1012).

	N. (%)
Chromoendoscopy prior to ER	393 (38.8)
Dyes (indigo carmine/methylene blue)	161 (132/29)
Opto-electronic (NBI, FICE, I-scan)	232 (127/19/86)
Magnification endoscopy prior to ER	89 (8.8)
Peripheral marking of lesion	129 (12.7)
Submucosal lifting prior to ER	1006 (99.4)
Standard injector needle	971 (96.5)
Hydro-jet device	35 (3.5)
Substance used for submucosal lifting	
Saline	365 (34.1)
Saline plus epinephrine	504 (47.1)
50% dextrose	77 (7.6)
Glycerol	48 (4.7)
Hyaluronic acid	10 (0.9)
Succynilated gelatine	67 (6.2)
Technique of resection	
Inject and cut	969 (95.8)
Lift and cut	20 (2.0)
Suck and cut	6 (0.6)
ESD	17 (1.7)
Type of snare	
Standard	478 (47.2)
Crescent	443 (43.7)
Single wire	76 (7.1)
Semi-rigid	69 (6.5)
Type of high-frequency current delivery programme	
Endocut	899 (88.8)
Free	113 (11.2)
Adjunctive procedures	
APC treatment of resection margins	186 (18.4)
Magnified inspection of the resected margins	51 (5.0)
Tattooing	45 (4.4)
Clip closure of resection margins	325 (32.1)

ESD: endoscopic submucosal dissection; APC: argon plasma coagulation; ER: endoscopic resection.

Italian Society for Digestive Endoscopy to prospectively collect data on colorectal ER performed in 46 Italian academic or community-based endoscopy units.

Minimal standards required for participating units were set a priori and included high-volume endoscopic activity (≥1200 colonoscopies/year) and adequate local expertise in colorectal ER (≥130 resections/year).

Lesions were assessed by white-light colonoscopy without cap attachment. Lesions were classified according to the Paris Classification of lesion morphology [23]. All NPLs that were larger than 10 mm in width were more appropriately termed "laterally spreading tumours" (LST), and sub-classified as either granular or non-granular [24].

Consecutive or referred patients were enrolled during a 3-month run-in period from May 2010 to July 2010. Patients were included if they had colonoscopic evidence of a sessile polyp >10 mm and/or a laterally spreading tumour and/or a depressed NPL of any size (Paris classification types 0-IIc or 0-IIa + 0-IIc). Patients who refused to provide informed consent and those with pedunculated polyps or sessile polyps < 10 mm or flat-elevated NPL (Paris classification types 0-IIa and 0-IIb) were excluded.

For details of procedures, outcome measures and definitions, follow-up schedule and data management and analysis, see Appendix B (Supplementary Material [25,26]).

3. Results

A total of 928 patients (58.6% males; mean age, 66.0 ± 10.6 years; range, 32–87) with 1012 lesions were enrolled. Clinical features of patients and endoscopic characteristics of the resected lesions are outlined in Table 1. Mean age of males was significantly higher than that of females (66.8 ± 10.2 vs. 64.9 ± 10.8, $p = 0.01$). Use of antiplatelet agents was recorded in 161 patients (17.3%) and was withheld prior to ER in 138 cases (85.7%). Use of oral anticoagulants was recorded in 29 patients (3.1%) and was systematically switched to low-molecular-weight heparin or fractioned heparin 3–5 days before ER in all cases. Sessile polyps and granular-type LSTs were most prevalent. A depressed NPL was recorded in 8.7% of cases. The majority of the lesions (568/1012, 56.1%) were located proximally to the splenic flexure. Overall, 624 lesions (61.6%) were less than 20 mm in size. Lesions larger than 30 mm were recorded in 18% of sessile polyps and 22% of LSTs. Median size of depressed NPLs was 7 mm [IQR 6–9 mm], while that of sessile polyps was 18 mm [IQR 12–28 mm], and that of LSTs was 21 mm [IQR 15–29 mm]. A previous attempt of resection by the referring endoscopist had occurred in 42 cases (4.1%).

Technical aspects of the resection are detailed in Table 2. Prior to ER, a subgroup of 393 lesions (292 LST, 88 depressed NPL and 13 sessile polyps) was assessed by means of image-enhanced endoscopy. A non-neoplastic pattern (Kudo type II) was reported in 5 cases, whereas a neoplastic non-invasive pattern (Kudo types IIIs, IIIL or IV) was reported in all other cases. Magnified inspection was reported in 89 of these lesions (71 depressed NPLs and 18 non granular LSTs). A neoplastic invasive pattern (Kudo type Vi/Vn) was recorded in 9/71 depressed lesions (6/9 showed submucosal cancer on histology), and in 9/18 non-granular LSTs (6/9 had submucosal cancer on histology). The standard "inject and cut" technique was by far the most widely accomplished variant of ER (95.8%). Only 17 lesions were resected using endoscopic submucosal dissection (ESD). This accounts for 1.7% of all ER and 4.4% of ER performed for lesions > 20 mm. In particular, a typical ESD was performed only in 8 patients and exclusively for rectal lesions (6 LSTs and 2 sessile polyps), while a simplified ESD was employed to remove the other 9 lesions (1 LST in the transverse colon, 3 sessile polyps in the sigmoid colon and 5 LSTs in the rectum).