



## Is Routine Histopathological Evaluation of Stapler Doughnuts Obtained During Anterior Resection Justified? An Attempt to Answer Million Dollar Question

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### Abstract

**Aim:** To assess the outcome of routine histopathological evaluation of stapler doughnuts obtained during anterior resection of recto sigmoid segment and bearing of doughnut positivity on eventual treatment plan for the patient. Material and methods: A prospective observational single centre study conducted at Kasturba Hospital, Manipal, for 2 years from December 2020 to October 2022. Study includes all the patients who underwent anterior resection with stapled, circular, end-to-end colo-rectal anastomosis (CEEA) for Carcinoma rectum.

**Results:** A total of 27 cases were recruited and both proximal and distal doughnuts were sent for histopathological evaluation in all the cases. Of all the 27 cases in the study, all the resection margins and doughnuts were reported to be negative for malignancy.

**Conclusion:** Doughnut histology had no bearing on the following course of treatment or the prognosis of the illness and clinical judgments were not revised in response to doughnut histology. There is a lack of advantage in routinely sending doughnuts for HPE in all circumstances. They can be sent only when the chance of a positive margin is thought to be higher without having a negative impact on patient care.

**Keywords:** Carcinoma Rectum; Anterior Resection; Circular end to end Anastomosis Stapler Device (CEEA); Stapler Doughnuts

### Introduction

Surgery is the mainstay of treatment for rectal malignancies. The anastomosis in the deep pelvis, which is otherwise challenging when done by hand-sewing method, is made easier by the CEEA (Circular End to End Anastomosis) stapler device used in anterior resection [1]. When fired, this circular stapler gun cuts circular doughnuts of tissue from the anastomosis, one proximal and one distal, which are submitted for standard histological analysis together with the tumour and resection margins [2]. Tumour resection margins are one of the most crucial prognostic indicators for colorectal carcinomas; positive margins indicate a higher risk of recurrence and, consequently, a decrease in both cancer-free and overall survival. Therefore, following anterior resection, tumour with resection margins and both proximal and distal doughnuts, obtained from circular stapling device, are usually sent for histo-

logical investigation to guarantee adequate excision of the tumour and negative margins. But, there is no evidence to support routinely inspecting doughnuts for malignancy, and multiple studies have questioned the practice's applicability, concluding that testing is superfluous [2-7]. Furthermore, these examinations are labour intensive, consumes considerable resources and time, and are expensive. If resection margins of the main specimen are negative, the doughnut histology does not offer any beneficial information [3]. If resection margins of the main specimen are positive, and the doughnuts are positive for malignancy, this indicates a non-curative procedure, and patients are at high-risk for the local recurrence of colorectal cancer [8]. If resection margins of main specimen are positive and yet the margin of the doughnut is negative, it is to be treated as a positive resection margin [3]. Therefore, would a doughnut when reported positive for malignancy, alter the subsequent course of

treatment or would selective histopathological analysis of doughnuts, instead of routine examination be justified. Thus, this study adds to our understanding of how routine doughnut inspection affects future patient care.

### Materials and Methods

The study is a prospective observational study involving department of General Surgery, Surgical Gastroenterology, and Surgical Oncology at Kasturba Hospital, Manipal, conducted for 2 years during the period of December 2020 to October 2022. After taking written informed consent, data was collected from the enrolled patients who are diagnosed to have carcinoma of the rectum and rectosigmoid segment and underwent anterior resection with CEEA. Histopathological reports for information regarding the positive status of stapler doughnuts were obtained and its role in overall management of the patient, studied. Patients undergoing anterior resection for benign indications and patients undergoing anterior resection and reconstruction without application of circular stapler were excluded from the study.

### Results and Discussion

A total of 27 cases were recruited and both proximal and distal doughnuts were sent for histopathological evaluation in all the cases. The most commonly effected age group was 5<sup>th</sup> and 6<sup>th</sup> decade with slight male preponderance. 51.9% (14 cases) received neoadjuvant therapy either in the form of NACT (7.4%, 2 cases), SCRT (7.4%, 2 cases) or NACT+RT (37%, 10 cases). The most common location of the tumour, as per intraoperative findings, was rectosigmoid junction, which was seen in 11 patients, accounting for 40.7% of the cases, the second most being lower rectum seen in 25.9% (7 patients). Adenocarcinoma was the most commonly reported histological type seen in 81.4% (22 patients) of the cases. The most common grade of tumour on final histopathology report was moderate differentiation, accounting for 59.25% of the cases (16 patients). The second most common being well differentiation, seen in 33.3% (9 cases). Of all the 27 cases in the study, all the resection margins and doughnuts were reported to be negative for malignancy. 17 patients accounting for 62.9% had undergone adjuvant chemotherapy. While one patient had expired due to urosepsis 1 month after surgery, 9 patients (33.33%) received no adjuvant therapy in any form. None of the patients had received adjuvant radiotherapy, nor did they undergo re-surgery. The data obtained from the HPE reports of all 27 cases is depicted in table 1.

HPE report	Frequency	Percentage
<b>A. Tumor location</b>		
Rectosigmoid junction	11	40.7%
Upper rectum	5	18.5%
Middle rectum	3	11.1%
Lower rectum	7	25.9%
No residual tumor identified	1	3.7%
<b>B. Histology</b>		
No residual tumor identified	1	3.7%
Adenocarcinoma	22	81.4%
Adenocarcinoma with mucinous differentiation	1	3.7%
Mucinous adenocarcinoma	3	11.1%
<b>C. Grade of cancer</b>		
No residual tumor identified	1	3.7%
Moderately differentiated	16	59.25%
Well differentiated	9	33.3%
Not graded	1	3.7%
<b>D. Proximal margin</b>		
Uninvolved	27	100.0%
<b>E. Distal margin</b>		
Uninvolved	27	100.0%
<b>F. Proximal doughnut</b>		
Uninvolved	27	100.0%
<b>G. Distal doughnut</b>		
Uninvolved	27	100.0%
<b>Total</b>	<b>27</b>	<b>100.0%</b>

**Table 1:** Reporting of Histopathological examination of Carcinoma patients.

#### Margin status

- Proximal margin uninvolved-100%
- Distal margin uninvolved-100%

#### Doughnut status

- Proximal doughnut uninvolved-100%
- Distal doughnut uninvolved-100%

## Conclusion

Doughnuts obtained during anterior resection need not be sent for histopathological evaluation in all the cases and can be sent only when the probability of positive margin is thought to be higher.

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