Original Research Article

Histopathological spectrum of colorectal carcinomas

Nandish V S[1,*], Sowmya B U[2]

[1]Dept. of Pathology, SS Institute of Medical Sciences and Research Center, Davanagere, Karnataka, India
[2]HCG Cancer Center, Bangalore, Karnataka, India

A R T I C L E   I N F O

A B S T R A C T

Introduction: Colorectal carcinomas are global oncologic problem faced by medical fraternity as it is the third most common carcinoma in men after lung and prostate carcinomas also second in women after breast carcinoma worldwide. 1998 to 2003, and the death rate decreased from 2.8% annually over the period 2001 to 2003. A great majority (98%) of all carcinomas in the colorectum are adenocarcinomas. The cause and pathogenesis of colorectal carcinomas are related to both environmental and genetic factors. Both gross as well as histopathological typing helps in definitive diagnosis and further management of the patient.

Materials and Methods: This one year retrospective study included forty-three (43) cases of colorectal carcinomas. All the resected specimens received in the laboratory were immediately fixed in 10% formalin for at least 24 hours. Gross features of specimen were noted and multiple representative sections were taken for routine processing. After detailed study of sections under the light microscope the final diagnosis was given along with disease stage (Dukes classification). The patient details like age, sex, clinical diagnosis were obtained from the requisition forms that were sent along with the specimen.

Results: There were total of forty-three (43) patients of colorectal carcinomas during the study one year. Male to female ratio was 1.15:1. Majority of the patients belonged to the age group of 58-67 years. The most common malignancy was adenocarcinoma followed by mucinous carcinoma and neuroendocrine carcinoma. The most common anatomical site involved was rectum.

Conclusion: This study concludes that colorectal carcinomas are more common in 5th and 6th decade of life with slight male preponderance. The most common malignant lesion being moderately differentiated adenocarcinomas. The most common location being rectum with highest incidence of Dukes stage B. The histopathological examination remains the gold standard for the diagnosis and further management.

1. Introduction

Colorectal carcinomas are global oncologic problem faced by medical fraternity as it is the third most common carcinoma in men after lung and prostate carcinomas also second in women after breast carcinoma worldwide.[1–4] The incidence in about 7/100000 in India.[3,5] and approximately 1.2 million new cases of colorectal adenocarcinomas and 6 lakh associated deaths, occur each year worldwide.[6,7] The overall incidence of colorectal carcinomas decreased at the rate of 2.1% per annum from 1998 to 2003, and the death rate decreased from 2.8% annually over the period 2001 to 2003.[8,9]

A great majority (98%) of all carcinomas in the colorectum are adenocarcinomas. The cause and pathogenesis of colorectal carcinomas are related to both environmental and genetic factors.[3] The incidence in higher in North America, Australia and Europe compared to developing countries. The geographical differences for colorectal carcinomas are explained by dietary and other environmental factors.[1,6,10] Colorectal carcinoma patients have the chance to undergo curative resection. About 10% of patients present with local invasion thus making resection impossible and 20% of patients present with distant metastasis at the time of

---

* Corresponding author.
E-mail address: nandishvs@gmail.com (Nandish V S).

diagnosis.[4,11] Both gross as well as histopathological typing helps in definitive diagnosis and further management of the patient.[6]

2. Materials and Methods

This one year retrospective study included forty-three (43) cases of colorectal carcinomas diagnosed between January 2017 and December 2017. All the resected specimens received in the laboratory were immediately fixed in 10% formalin for at least 24 hours. Gross features of specimen were noted and multiple representative sections were taken for routine processing. Paraffin embedded of sections of 4 micrometer were taken and stained with Hematoxylin and eosin (H&E). After detailed study of sections under the light microscope the final diagnosis was given along with disease stage (Dukes classification). The patient details like age, sex, clinical diagnosis were obtained from the requisition forms that were sent along with the specimen. The location of the tumor was categorized as ascending, transverse, descending, sigmoid colon and rectum.

3. Results

There were total of forty-three (43) patients of colorectal carcinomas during the study one year. It included 23(53.48%) male and 20 (46.52%) female patients with a male to female ratio of 1.15:1. (Table 1)

Majority of the patients, 16(37.21%) belonged to the age group of 58-67 years with the youngest being 18 years and oldest being 81 years old.

The most common malignancy was adenocarcinoma 37(86.04%), followed by mucinous carcinoma and neuroendocrine carcinoma of 2(4.65%) in each category. There were 1(2.33%) each case of malignant melanoma and signet ring cell carcinoma. (Table 2) The histological differentiation of adenocarcinomas included 29 (78.38%) moderate and 8 (21.62 %) poor differentiated carcinomas. (Table 2)

The most common anatomical site involved was rectum 18(41.86%) followed by ascending colon 9(20.94%), sigmoid colon 8 (18.60%), descending colon 4(9.30%), and 2(4.65%) each of transverse colon and cecum respectively. (Table 3) The lymphovascular invasion (LVI), perineural invasion (PNI) and tumor budding was seen in 17(39.53%), 9(20.93%) and 26(60.46%) cases respectively. (Table 4)

There were 25 cases (58.14%) in stage B (with 7 cases in B1 and 18 cases in B2) and remaining 18 cases (41.86%) in stage C (with 14 cases in C1 and 4 cases in C2). (Table 5)

4. Discussion

The incidence of colorectal carcinomas are lower in India, being 5.9 and 5.3 per 100,000 in males and females respectively as compared to 32.9 and 24.4 per 100,000 in US.[1,12] Among the Asian population, Singaporeans have
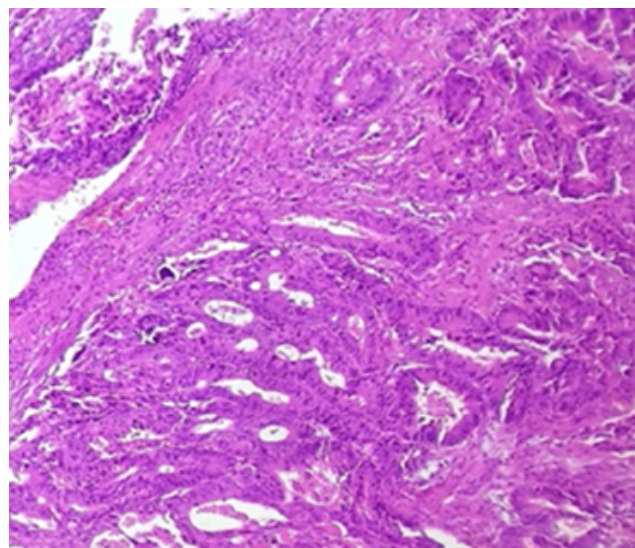

Fig. 1: Infiltrative glands in Adenocarcinoma. x10, H&E
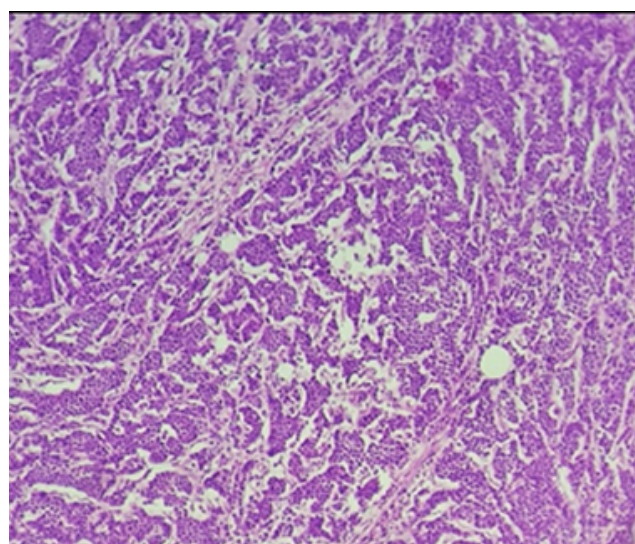

Fig. 2: Organoid pattern in Neuroendocrine carcinoma. x4, H&E

higher incidence of colorectal carcinomas than Malays and Indians.[1,13]

In the present study, the incidence of colorectal carcinomas was highest (37.21%) between the age group of 58-67 years which was comparable to the study done by Sharma P et al[3] which was 33.8% of cases. A highest proportion of cases were seen in males as compared to females with M:F ratio of 1.15:1 and studies conducted by Rajesh S et al[1], Kudale SS et al[14] showed similar results. The most common anatomical site being rectum (41.86%) followed by ascending colon (20.93%) and sigmoid colon (18.60%). Similar results were obtained by Rasool M et al[15], Sharma P et al[3] and Laishram RS et al.[1]

Table 1: Age and sex incidence of colorectal carcinomas

Age groups	F	M	Total	Percentage
18-27	1	2	3	6.98
28-37	2	2	4	9.3
38-47	3	4	7	16.3
48-57	4	5	9	20.93
58-67	7	9	16	37.21
68-77	2	1	3	6.98
78-87	1	-	1	2.3
Total	**20**	**23**	**43**	**100**

Table 2: Incidence of histological type of carcinoma

Diagnosis	Number	Percentage
Adenocarcinoma	37	86.04
Malignant Melanoma	1	2.33
Mucinous Adenocarcinoma	2	4.65
Neuroendocrine carcinoma	2	4.65
Signet ring cell carcinoma	1	2.33
Total	**43**	**100**

Table 3: Anatomical site distribution

Diagnosis/Site	Ascending colon	Caecum	Descending colon	Rectum	Sigmoid colon	Transverse colon	Total
Adenocarcinoma	6	2	4	16	7	2	37
Malignant Melanoma	-	-	-	1	-	-	1
Mucinous Adenocarcinoma	-	-	-	1	1	-	2
Neuroendocrine carcinoma	2	-	-	-	-	-	2
Signet ring cell carcinoma	1	-	–	-	-	-	1
Total	**9**	**2**	**4**	**18**	**8**	**2**	**43**

Table 4: Incidence of LVI, PNI and Tumor budding

Diagnosis	LVI		PNI		Tumor Budding	
	Absent	Present	Absent	Present	Absent	Present
Adenocarcinoma	23	14	30	7	15	22
Malignant Melanoma	-	1	1	-	-	1
Mucinous Adenocarcinoma	2	-	2	-	-	2
Neuroendocrine carcinoma	1	1	1	1	2	-
Signet ring cell carcinoma	-	1	-	1	-	1
Total	**26**	**17**	**34**	**9**	**17**	**26**
Grand Total	**43**		**43**		**43**	

Table 5: Distribution of Dukes staging

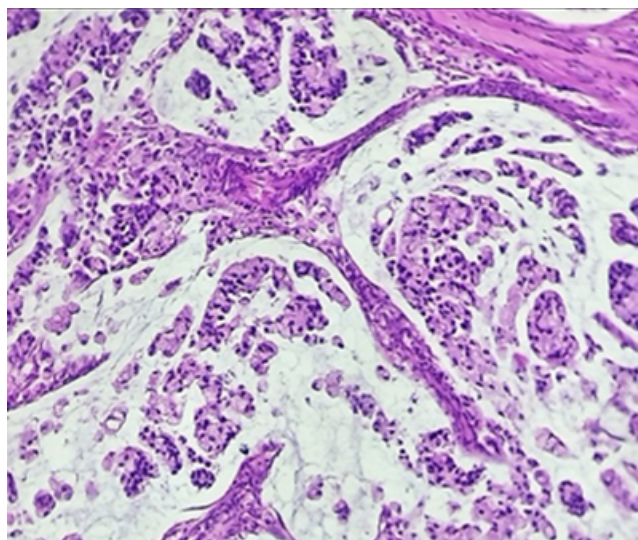| Modified Duke's		Number	Percentage
Stage A		0	0
Stage B	B1 B2	7 18	58.14
Stage C	C1 C2	14 4	41.86
	Total	**43**	**100**

Fig. 3: Pleomorphic cells floating in pools of mucin. x10, H&E

Adenocarcinoma was the most common histological variant (86.04%) which was also consistent with the studies done by Kudale SS et al[14] and Shah N et al.[16] There was one case (2.32%) of malignant melanoma of rectum in a 41 year old male. Nicholson AG et al[17], in their study found that primary malignant melanomas of rectum are rare. High incidence of moderately differentiated carcinomas (78.38%) was observed in the present study, similar to the studies done by Leishram RS et al[1] and Uma L et al.[6]

Lymphovascular invasion, perineural invasion and tumor budding was seen in 39.53%, 20.93% and 60.46% of cases respectively. Dukes B stage was the most common stage of carcinomas, which is comparable to the study conducted by Laishram P et al[1], Nannavati MG et al[18] and Sharma P et al.[3]

5. Conclusion

This study concludes that colorectal carcinomas are more common in 5th and 6th decade of life with slight male preponderance. The most common malignant lesion being moderately differentiated adenocarcinomas. The most common location being rectum with highest incidence of Dukes stage B. The histopathological examination remains the gold standard for the diagnosis and further management.

6. Conflict of Interest

None.

7. Source of Funding

None.

References

1. Laishram RS, Kaiha N, Shimray R, Devi SB, Punyabati P, et al. Histopathological evaluation of colorectal carcinomas status in Manipur, India. *Int J Pathol*. 2010;8:5–8.
2. Howe HL, Wu X, Ries LA, Cokkinides U, Ahmed F, et al. Annual report to the nation on the Status of Cancer, 1975-2003, featuring cancer among US Hispanic/Latino populations. *Cancer*. 2006;107:1711–1142.
3. Sharma P, Dekaa M. A study of neoplastic lesions of colorectum in a tertiary care hospital. *IJSS*. 2015;3:88–91.
4. Caliskan C, Guler N, Karaca C, Makay O, Firat O, et al. Negative prognostic factors in colorectal carcinoma: An analysis of 448 patients. *Indian J Surg*. 2010;72:243–248.
5. Desai PB. Carcinoma of colon. *Bombay Hosp J*. 2000;42:256–259.
6. Jamkhandi U, Patil SB, Rajashekar KS. A histopathological study of colorectal neoplasms in a tertiary care hospital. *Indian J Pathol Oncol*. 2019;6(3):484–488.
7. Turner JR. The gastrointestinal Tract. In: Kumar V, Abbas AK, Aster JC, editors. Robbins & Cotran Pathologic basis of disease, 9th ed. New Delhi: Reed Elsevier India Pvt limited. 2014;p. 810–815.
8. Mohsin-Ul-Rasool, Mubeen B, Andrabi RS, Hamid S, Rasool Z, et al. Histopathological study of neoplastic lesions of large intestine in Kashmir Valley, India. *Int J Res Med Sci*. 2014;2:1097–1100.
9. Jemal A, Siegel R, Ward E, Murray T, Xu J, et al. Cancer statistics. *CA cancer J Clin*. 2007;57:43–66.
10. Parkin DM, Bray F, Ferlay J, Pisani P. Global Cancer Statistics. *Ca Cancer J Clin*. 2002;55:74–108.
11. Meyer G. Gastroenterology and hepatology. Edited by M. Cremer, G. Krejs, G. Ramadori, and J. Rask-Madsen, New York, McGraw-Hill, 1999, ISBN 007-709519-7. *Am J Gastroenterol*. 1999;95:333.
12. Parker SL, Tong T, Bolden S. Cancer Statistics. . *CA Cancer J Clin*. 1996;46:5.
13. Lee YS, Chong SM. Pathology of the five most common cancers in Singapore. *Ann Ae Med*. 1990;19:188–189.
14. Kudale SS, Mallya MV, Pinto RG. A One-year Study of Colorectal Cancer in a Tertiary Care Hospital. *todaysclinicaincom*. 2018;p. 1–12.
15. Rasool MU, Mubeen B, Hamid S, Rasool Z, Shah P, et al. Histopathological study of neoplastic lesions of large intestine in Kashmir Valley, India. *Int J Res Med Sci*. 2015;3:1–5.
16. Shah N, Jaisar N, Patel N, Shah CK. Histomorphological evaluation of colon lesions. *Int J Res Med Sci*. 2017;5:4254–4258.
17. Nicholson AG, Cox PM, Marks CG, Cook MG. Primary malignant melanoma of the rectum. *Histopathol*. 1993;22(3):261–264.
18. Nanavati MG, Parikh JH, Gamit KS, Modh SD. A histopathological study of intestinal lesions. *Int J Sci Res*. 2014;3:326–330.

Author biography

Nandish V S Assistant Professor

Sowmya B U Consultant Pathologist

Cite this article: Nandish V S , Sowmya B U . Histopathological spectrum of colorectal carcinomas. *J Diagn Pathol Oncol* 2019;4(4):260-263.