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Research Article

A Comparative Study Between the Oncological Results of Right and Left Colic Cancers

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Abstract

Introduction: There are embryonic, anatomical, and histological differences between right colon (RCC) and left colon (LCC) cancers. Many studies have sought to determine survival and prognosis based on the location of the tumor. The present study aims to compare the oncological results between RCC and LCC after curative resection.

Materials and methods: It is about a bi-centric retrospective study. The data collection of patients undergoing curative resection for RCC and LCC was made over a period, from July 2004 to December 2015.

Results: On 353 patients, 156 were operated for RCC or 44% and 197 were operated for LCC or 56%. No significant difference in age or sex or time to surgery. It is noted that LCCs were diagnosed at a later stage. RCCs had more carcinoma type poorly differentiated. The median follow-up is 96 months. The survival curves are practically superimposable over a 36-month follow-up, as well as for survival without recurrence. Beyond and up to 96 months, the recurrence-free survival following a LCC is 94.40 months, higher than the one of the RCC which is 89.04 months. Overall survival is almost identical. LCCs have better survival for stage I cancers (P = 0.01).

Conclusion: On the basis of the current data, LCCs have a better survival result than RCC after curative resection (especially for stage I and SWR). Larger scale studies are needed. Determination of the impact on screening and appropriate specialized treatment related to the localization of 1 colon cancer is necessary.

Keywords: Colorectal cancer; Localization; Survival

Introduction

Colon cancer is the third most common cancer in the world, with an estimated incidence of 72,090 cases among men and 70,480 among women in the United States each year. It is also the third leading cause of cancer death with approximately 26,580 deaths of men and 24,790 deaths of women each year [1]. The gross incidence of colorectal cancer among Algerian men doubled between 2008 and 2015. In 2015, the incidence of colorectal cancer in men is getting closer and closer to that of the lung, and prostate cancer is returning to the third place before bladder cancer. Colorectal cancer is the second most common cancer in Algiers after breast cancer [2]. There are proofs that the right colon cancer (RCC) is different from left colon cancer (LCC) and rectal cancer. There are differences in embryological origins, as well as anatomical, histological, genetic and immunological differences between RCC and LCC [1,3]. The segments of the proximal and distal colon have different embryological origins. The first develops from the midgut and the last from the posterior intestine. Both are physiologically different [4]. The main treatment for colon cancer is surgical resection. The different types of resection depend on the location of the tumor are right hemicolectomy, enlarged right hemicolectomy, left hemicolectomy and left and right segmental colectomies. The same oncologic findings were obtained in the literature for both classical and laparoscopic approaches. RCCs are associated with iron deficiency anemia, late stage and advanced age. In addition, RCC has a tendency to involve large polypoid lesions, exophytic, developing in the lumen of the colon. In contrast, LCCs tend to include invasive constrictive lesions encircling the lumen and causing obstruction. [5] Tumor samples also showed

differences in gene expression between RCC and LCC [4-7]. Most studies have reported poorer oncologic results in patients with RCC compared to patients with LCC. [8]. However, recent studies have indicated that the prognosis of localized RCCs is better than that of LCCs [9,10]. The influence of these potential differences on the prognosis has not been validated. Others concluded that there is no significant difference in overall survival (OS) between different tumor locations. [11,12]. The present study aims to compare the oncological results between RCC and LCC after curative resection.

Materials and Methods

Between July,2004 and December 2015, 353 patients underwent surgery for right and left colon adenocarcinoma, non-metastatic. Colon colonization, transverse colon cancer, recto-sigmoid hinge and rectal cancer were excluded. This is a bi-centric retrospective study whose data were collected prospectively. Patients were closely monitored and included in a database until December 2015 or until death. Patients in both groups were compared on the following parameters: age, sex, American Society of Anesthesiology (ASA) classification, presence of lympho-vascular invasion, degree of histological differentiation, mucinous histological subtype, number of lymph nodes removed, surgical margins, TNM classification (UICC, 7th edition), serum carcinoembryonic antigen (CEA) levels at the time of diagnosis, overall survival and no recurrence. The statistical analysis was done by SPSS software (Statistics 22). The Kaplan-Meier method was used to establish survival curves. The use of log rank tests, Cox model and Fisher's exact test to analyze overall survival and recurrence-free survival and evaluate the significance.

These tests allowed to perform a univariate and multivariate analysis, to look for the association of independent variables with the recurrence of the tumor and the overall survival.

Result

Among the 353 patients, 156 were operated for RCC or 44% and 197 were operated for LCC or 56%. Both groups were analyzed and compared. The average age was 56 (range: 22-83 years). Figures 1 and 2 summarize the clinical, histological and oncological findings of the subjects (Figures 1).

Caractéristiques	Colon droit (156)	Colon gauche (197)	Valeur P (0.185)
Age (an)			0.513
moyenne	56.01 (22-83)	58.09 (20-83)	
< 65	110 (70.51%)	134 (68.02%)	
≥ 65	46 (29.49%)	61 (31.98%)	
Sexe Féminin	70 (44.87%)	99 (50.25%)	0.335
Sexe Masculin	86 (55.13%) ★	98 (49.75%)	
BMI	23.73 (10-38.61)	24.82 (12.80-45.71)	0.418
<20	25 (16.7%) ★	25 (13.2%)	
20-25	85 (56.7%)	95 (50%)	
>25	40 (26.7%)	70 (36.8%) ★	
ASAI	103 (66.5%) ★	112 (56.9%)	0.06
ASAII	41 (26.5%)	76 (36.8%) ★	
ASAIII	11 (7.1%)	8 (4.1%)	
ASAIV	0 (0%)	1 (0.5%)	
Présentation clinique			0.147
OI	11 (15.5%)	13 (18.8%)	
Ascite	1 (1.4%)	1 (1.4%)	
Amaigrissement	35 (49.3%)	43 (62.3%) ★	
Masse	24 (33.8%) ★	11 (15.9%)	
Hb	9.89 ±2.458 ★	11.44 ±1.999	0.057
CTC grade 0	32 (20.9%)	75 (38.1%)	0.001
CTC grade 1 et plus	121 (79.1%)	122 (61.9%)	0.001
Ace positif	59 (40%)	73 (38.4%)	0.735
Ca 19.9 positif	34 (23.3%)	37 (19.9%)	0.501
Durée			0.087
Plus 150	73(46.8%)	110(56.1%)	
Moins 150	83(53.2%)	86 (43.9%) ★	
Transfusion	54 (34.6%) ★	34 (17.3%)	<0.001
Morbidité	28 (17.9%)	37 (18.8%)	0.523
Mortalité 0-30	7 (4.5%)	4 (2.0%)	0.225

Figure 1: Patient Characteristics.

The median follow-up is 96 months. The survival curves are practically superimposable over a 36-month follow-up, as well as for survival without recurrence. Beyond and up to 96 months, the recurrence-free survival following an LCC is 94.40 months, higher than that of the RCC which is 89.04 months (Figure 2 and 3).

The overall survival is almost identical, it is 77.65 months for the RCC and 78.52 months for the LCC (Figure 4).

LCCs have better survival for stage I cancers (P = 0.01). No significant difference between the 2 groups for morbidity (17.9% vs 18.8%). The 30-day mortality is higher in the RCC group at 4.5% (7 patients) vs 2% (4 patients) in the LCC group. In univariate analysis, the poor prognostic factors for the overall survival rate that have been identified are advanced age (over 65 years), T3-4 stages, N stage (N1-2), and postoperative morbidity for both groups (Figure 5).

The number of lymph nodes removed, the peri-nerval girdling and the mucinous histological type for RCC. And the large size of the tumor, the ASA classification (II and III), high CEA and CA 19-9 levels, blood transfusion, the presence of vascular emboli and the

degree of differentiation for the LCC group. In multivariate analysis, poor prognostic factors for overall survival rate are: Large tumor size and mucinous histological type for the RCC group. Weight loss and adjuvant chemotherapy for the LCC group (Figure 6).

caractéristiques	Colon Droit (156)	Colon Gauche(197)	Valeur P
Taille (cm) < moy > moy	 69 (46.3%) 80 (53.7%) ★	 126 (66.3%) 64 (33.7%)	<0.001
BDF MDF PDF	68 (45.3%) 54 (36%) 11 (7.3%)	116 (60.7%) ★ 49 (25.7%) 9 (4.7%)	0.003 0.026 0.214
Mucineux	12	9	0.105
Marge Amont suffisante Aval suffisante	 136 (93.8%) 143 (98.6%)	 179 (95.2%) 172 (93%)	 0.650 0.000
Curage Inf 12 sup12	 58 (38.7%) 92 (61.3%) ★	 97 (51.1%) 93 (48.9%)	0.028
Stade N N0 N1 N2	 61 (43.6%) 51 (36.4%) 28 (20%)	 91 (49.2%à 59 (31.9%) 35 (18.9)	0.586
emboles	59 (39.6%)	59 (30.9%)	0.176
Peri nerf	38 (26.8%)	49 (25.9%)	0.934
Stade 0 I II III IV	 5 (3.3%) 9 (6.0%) 26 (17.2%) 89 (58.9%) 22 (14.6%)	 6 (3.1%) 19 (9.9%) 25 (13.1%) 99 (51.8%) 42 (22%)	0.209
Chimio adj	74 (47.7%)	99 (50.3%)	0.668
Récidive	0 (0%)	30 (15.2%) ★	<0.001

Figure 2: Characteristics of patients (continued).

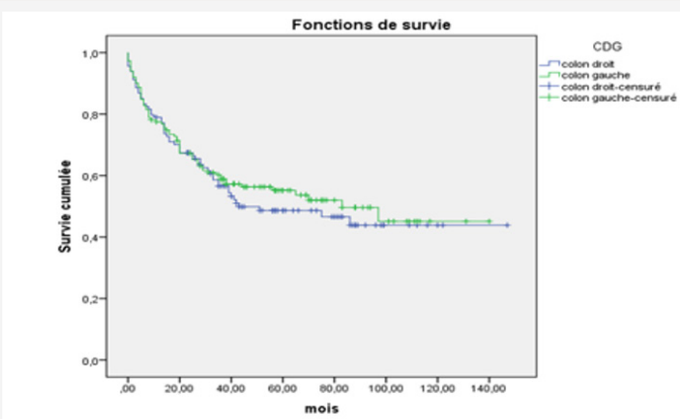

Figure 3: Global Survival (RCC: 77.65 months / LCC: 78.52 months).

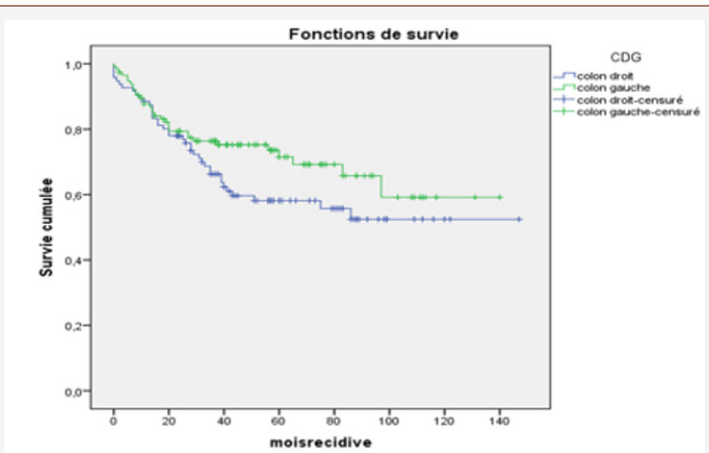

Figure 4: Survival without recurrence (RCC: 89.04 months / LCC: 94.40 months).

	Colon droit			Colon gauche		
variables	B	Sig	Exp B	B	Sig	EXP B
Tranche Age	0.595	0.02	1.813	0.485	0.047	1.624
ASA	0.425	0.027	1.530	0.656	0.001	1.927
Morbidité	0.622	0.039	1.862	0.755	0.005	2.128
Val N	0.765	0.000	2.150	0.812	0.000	2.252
Stade	0.835	0.001	2.304	1.412	0.000	4.103
Mucineux	0.815	0.017	2.342	0.616	0.152	1.852
perinerfs	0.600	0.038	1.822	0.364	0.106	1.440
Curage/12	-0.599	0.030	0.549	0.275	0.276	1.317
Val ACE	0.720	0.11	2.054	1.300	0.000	3.668
Val CA19.9	0.680	0.18	1.973	1.597	0.000	4.938
CTC	-0.153	0.213	0.858	0.539	0.000	1.714
transfusion	0.460	0.084	1.583	0.714	0.007	2.041
Taille tumeur	0.013	0.758	1.014	0.096	0.044	1.101
Histologie BDF MDF PDF	 -.190 -0.417 0.645	 0.492 0.184 0.114	 0.827 0.659 1.906	 -0.935 0.836 0.332	 0.000 0.098 0.522	 0.393 2.306 1.393
Emboles	0.452	0.104	1.571	0.765	0.000	2.150

Figure 5: Univariate Analysis.

	Colon droit			Colon gauche		
Variables	B	Sig	Exp B	B	Sig	Exp B
Taille tumeur	1.373	0.012	3.946			
Mucineux	0.815	0.027	1.842			
Chimio adj				2.017	0.001	7.515
Amaigrissement				2.481	0.005	1.484

Figure 6: Multivariate Analysis.

Discussion

The present study aims to compare the oncological results between RCC and LCC after curative resection. Colon cancer has different clinical pathological features and genetic differences between the right colon and the left colon. Many studies have reported that patients with RCC are older and more often women; moreover, they have more advanced tumor stages, an increased tumor size, more often poorly differentiated tumors and different models of biological tumors [13,14]. The LCC incidence rate is higher than that of the RCC, and the latest figures released by the American Cancer Society confirm a higher proportion of LCC (51%) than the RCC (42%) in the United States [15]. In this study, the LCC (n = 197, 55.8%) is greater than the RCC (n = 156, 44%) over the same period (2004-2015).In this study, mean age and sex ratio are not significantly different between the 2 groups. The median ages are 56.01 years (RCC) and 58.09 years (LCC) (P=0.513) and the sex ratio is 0.81 (RCC) and 1.01 (GCC) (P = 0.335). Indeed, previous studies have reported poorer oncologic results in patients with RCC compared to patients with LCC [16-18]. The survival curves are practically superimposable on a 36-month follow-up (OS + SWR). Beyond and up to 96 months, the recurrence-free survival following an LCC is 94.40 months, higher than that of the RCC which is 89.04 months. Overall survival at age 8 is almost identical, at 77.65 months for RCCs and 78.52 months for LCCs. LCCs have better survival for stage I cancers (P = 0.01).

In univariate analysis, the poor prognostic factors for the rate of ILI that have been identified are advanced age (over 65 years), T3-4 stages, stage N (N1-2), and postoperative morbidity for 2 groups.

The number of lymph nodes removed, the peri-nerval girdling and the mucinous histological type for RCC. And the large size of the tumor, the ASA classification (II and III), high CEA and CA 19-9 levels, blood transfusion, the presence of vascular emboli and the degree of differentiation for the LCC group. In the present study, the parameters that were analyzed as prognostic factors for OS and SWR after surgery in multivariate analysis were: The large tumor size and mucinous histological type for the RCC group, weight loss, and adjuvant chemotherapy for the LCC group. Indeed, the location of the tumor does not appear as an independent prognostic factor for OS after surgical treatment in colon cancer. The present study has several limitations, including that it is retrospective, selection bias and a small sample. Nevertheless, it showed results similar to those of previous studies [16-18].

Conclusion

RCCs are associated with a more advanced stage, a large tumor size, more often poorly differentiated (mucinous) tumors, more lymph nodes removed and more peri-nerve sheathing than LCCs in this study. present study. On the basis of current data, LCCs have a better survival result than RCC after curative resection (especially for stage I and SWR). In contrast, tumor localization does not appear to be an independent prognostic factor for OS after surgical treatment in colon cancer. Larger scale studies are needed. Determination of the impact on screening and appropriate specialized treatment related to the localization of colon cancer is necessary.

Acknowledgment

None.

Conflict of Interest

No conflict of interest.

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