original article

The effect of the surgical method on the number of disected lymph nodes in colorectal cancer surgery

Cerrahi yöntemin kolorektal kanser cerrahisinde diseke edilen lenf nodu özellikleri üzerine etkisi

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Abstract

Aim: By the dissemination of laparoscopic colorectal surgery there are many studies comparing the laparoscopic and open surgery. One of the parameters that are compared is the dissected lymph node number. The guidelines offer that there should be a minimum number of 12 lymph nodes for the staging of colorectal cancer. It is reported that only 48% of the resections achieve this number. In this study aims to compare the number of lymph nodes resected in laparoscopic and open colorectal cancer surgery.

Material and Method: The files of the patients who had colorectal surgery in our clinic in between January 2011 and January 2013 were retrospectively evaluated. The patients were divided into two groups as laparoscopic and open surgery groups. Patients' age, gender, preoperative diagnosis, tumor stage, surgical method, resected lymph node number and positivity of lymphatic metastasis were recorded. The groups were compared according to lymph node features.

Results: There were 55 patients with colorectal surgery [17(31%) laparoscopic and 38(69%) open surgery]. The mean age of the patients was 63.9±12.9, the groups were similar in terms of age, gender and the tumor stage. The mean dissected lymph node number was 17.2±4.8 for laparoscopy group and 18.7±5.2 for open surgery group. This difference was not statistically significant ($p>0.05$). There is no difference in between the groups in terms of metastatic lymph node numbers.

Conclusion: Laparoscopic surgery is as effective as open surgery in term of harvested lymph nodes. For the reliable tumor staging the surgeon and the pathologist should work together.

Keywords: Laparoscopic surgery, lymph node, colorectal surgery

Öz

Amaç: Laparoskopik kolorektal cerrahinin artmasıyla birlikte laparoskopik ve açık cerrahiyi karşılaştıran bir çok çalışma yapılmaya başlanmıştır. Karşılaştırma parametrelerinden bir taneside yeterli sayıda lenf nodunun çıkartılıp çıkartılmadığıdır. Yerinde bir kolorektal kanser evrelemesi için kılavuzların tavsiyesi 12'den aşağı lenf nodu çıkartılmaması gerektiği yönündedir. Literatürde kolorektal rezeksiyonların yalnızca %48'inde bu sayıya ulaşıldığı bildirilmiştir. Biz çalışmamızda laparoskopik kolorektal cerrahi ile açık cerrahinin lenf nodu diseksiyonu sayısı ve özellikleri üzerine etkisini değerlendirmeyi amaçladık.

Gereç ve Yöntem: Hastanemiz genel cerrahi kliniğinde Ocak 2011-Ocak 2013 tarihleri arasında kolorektal kanser cerrahisi uygulanan hastalara ait dosyalar retrospektif olarak tarandı. Hastalar açık cerrahi ve laparoskopik cerrahi uygulananlar olarak iki gruba ayrıldı. Hastaların yaş, cins, ameliyat öncesi tanıları, tümör evreleri, yapılan ameliyatın şekli, çıkarılan lenf nodu sayısı ve lenf nodlarında metastazın olup olmadığı kaydedildi. Gruplar lenf nodu özellikleri açısından karşılaştırıldı.

Bulgular: Toplamda 55 hastaya kolorektal kanser cerrahisi uygulanmıştı. Bunların 17 (%31)'sine laparoskopik, 38 (%69)' ine açık kolon cerrahisi uygulanmıştı. Hastaların yaş ortalaması 63,9±12,9 idi. Gruplar yaş, cinsiyet ve tümör evresi yönünden benzerdi. Laparoskopik cerrahide çıkartılan lenf nodu sayısı ortalama 17,2±4,8 iken açık cerrahide bu oran 18,7±5,2 idi. Bu fark istatistiksel olarak benzerdi ($p>0,05$). Metastatik lenf nodları değerlendirildiğinde ise iki grup arasında fark yoktu.

Sonuç: Çıkartılan lenf nodları bakımından laparoskopik cerrahi açık cerrahi kadar etkindir. Yerinde cerrahi evreleme yapılabilmesi için cerrah ve patologun beraber çalışması gerekmektedir.

Anahtar Kelimeler: Laparoskopik cerrahi, lenf nodu, kolorektal cerrahi

Introduction

Numerous studies have been conducted comparing laparoscopic surgery and open surgery together with the increase of the laparoscopic surgery procedures in the colorectal cancer surgery. It has been shown in many studies that patients who underwent laparoscopic surgery had shorter hospitalization periods,were discharged early, and had better cosmetic results than patients who underwent open surgery [1-4]. One of the comparison parameters is whether a sufficient number of lymph nodes have been removed or no. The number of lymph nodes removed and examined after surgery plays an important role in assessing the survival of patients and whether adjuvant therapy is required or not [5,6]. In our study we aimed to evaluate the effect of laparoscopic surgery and open surgery in colorectal cancers on the number and characteristics of lymph node dissection.

Material and Method

This study was performed in accordance with the Declaration of Helsinki of the World Medical Association and informed consent was obtained from all patients. The files of the patients who underwent colorectal cancer surgery in the general surgery clinic of our hospital during the last one year were retrospectively screened. Patients were divided into two groups as laparoscopic surgery (group 1) and open surgery (group 2). Patients' age, sex, body mass index (BMI), tumor stages, number of lymph nodes removed, and presence or absence of metastasis in the lymph nodes were recorded. The groups were compared in terms of characteristics of the lymph node. The statistical analyses were performed using SPPS v.18.0 (SPSS,Chicago,III,USA) program.

While categorical data were expressed in frequency and percentage, quantitative data were expressed as mean and standard deviation. In the comparison of categorical data, chi-square test was used and the independent t-test and Mann-Whitney U test were used for comparison of quantitative data. P value <0,05 was accepted as significant.

Results

Fifty five patients in total underwent colorectal cancer surgery within one year. 17 of these (31%) underwent laparoscopic and 38 (69%) open surgery. The age average

of the patients was 62.4±12.3. Of 55 patients 21 (38%) were females and 34 (62%) were males. While BMI was 28.1±8.2 in the laparoscopic group it was 28,6±6, in the open group. The groups were similar in terms of age, gender and BMI. The average of the lymph node number removed in the laparoscopic surgery was 17.2±4.8 and it was 18.7±5.2 in the open surgery. This difference was not statistically significant (p>0.05). There was no difference between two groups when the metastatic lymph nodes were evaluated (Table 1).

Table 1. Comparison of the groups according to demographic and lymph nodes findings

	Total	Laparoscopic	Conventional	P value
Age(year)	62.4±12.3	61.8±10.5	62.9±13.4	p>0.05
Sex n(%)				
Female	21 (%38)	7 (%41)	14 (%37)	p>0.05
Male	34 (%62)	10 (%59)	24 (%63)	
BMI(kg/m2)	28.3±7.2	28.1±8.2	28.6±6.8	p>0.05
Explored LN	18.2±5.3	17.2±4.8	18.7±5.2	p>0.05
Metastatic LN	1.9±3.1	1.7±2.8	2±3.4	p>0.05

BMI: Body mass index

Values are mentioned as aritmetic mean±standart deviation.

In the preoperative staging 3 patients had T1, 14 patients T2, 33 patients T3 and 5 patients T4 tumors in total (Table 2).

Table 2. Preoperative classification of tumors

	Laparoscopic (n)	Conventional (n)
T1	1	2
T2	6	8
T3	8	25
T4	2	3

Discussion

In studies comparing laparoscopic and open surgery in the colorectal cancer surgery, one of the criteria is to assess the number of lymph nodes removed. The number of lymph nodes that need to be removed suggests that a minimum of 12 lymph nodes need to be correctly staged according to the American Joint Cancer Committee (AJCC) and the National Cancer Institute (NCI) [5].

However, Goldstein et al. argue that this figure is even smaller and that as many lymph nodes as possible shall be removed [7]. Again, two large-scale studies in Europe have shown that more than 18 lymph node excisions increases the survival [8,9].

Together with the application of the laparoscopic surgery in the colorectal tumors the factors which affect the lymph node excision started to be indicated. Horzic et al. [10] have shown that male gender increases the number of excised lymph nodes by better tumor differentiation, deeper tumor invasion and acute inflammation. It was also found that more lymph nodes were excised in the surgeries during which complete mesocolic-excision and central vein ligation were performed [11].

A number of studies comparing laparoscopic and open surgery have been performed, and the number of lymph nodes extracted by both techniques has also been assessed in the majority of these studies. In most studies, the number of lymph nodes was found to be similar in laparoscopic and open surgery [12-16]. However the previously published articles showed that more lymph nodes were removed in the open surgery [2,17].

In our study, more lymph nodes were removed from the open surgery. In 2012, Wu et al. [18] proved once again that the meta-analysis was similar in terms of lymph node excision in both techniques.

Systematic reviews and meta-analysis showed that laparoscopic surgery and open surgery is not different in term of harvested lymph node counts[19-20]. In our study, lymph node dissection count was similiar in both laparoscopic and open surgeries and the number of excised lymph nodes in both surgeries is as desired.

There are also studies showing that not only the surgeon but also the pathologist is important in term of the number of removed lymph nodes [21,22]. In these studies, the authors would like to think that the replacement of the staff in the pathology department and the differences in the technique used in the removal of the specimen lymph nodes caused these results. Earlier studies have shown that special techniques such as fat removing techniques increase the number of lymph nodes removed [23]. Saklani et al. [24] in their observational study suggest that the fat removal technique should be used in cases of where 12 and less lymph nodes are removed, especially in T1 and T2 tumors.

The pathologist and surgeon must act together to ensure that a sufficient number of lymph nodes are removed during both laparoscopic colorectal cancer surgery and open colorectal cancer surgery. Laparoscopic surgery is as effective as open surgery in term of harvested lymph nodes.

Declaration of Conflicting Interests

The author declared no conflicts of interest with respect to the authorship and/or publication of this article.

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