Asian Journal of Research in Medicine and Medical Science

1(1): 14-17, 2019; Article no.AJRMMS.83

Radiotherapy after D2 Lymph Node Dissection +/- Omentectomy in Gastric Cancer

Yasemin Benderli Cihan[1*] and Baki Taştan[2]

[1]Department of Radiation Oncology, Kayseri Education and Research Hospital, Turkey.
[2]Department of General Surgery, Kayseri Education and Research Hospital, Turkey.

Authors' contributions

This work was carried out in collaboration between both authors. Author YBC designed, analysed, interpreted and prepared the manuscript. Author BT designed and prepared the manuscript. Both authors read and approved the final manuscript.

Mini-review Article

Received 22 January 2019
Accepted 10 April 2019
Published 16 April 2019

ABSTRACT

The review aims to address the indications and areas of radiotherapy in gastric cancer. Gastric cancer is the 5th most common cancer worldwide and ranks third in cancer deaths. It is an insidious disease and it is usually asymptomatic until it reaches the advanced stage. Surgical treatment is still standard treatment, although chemotherapy, radiotherapy and immunotherapy have been advancing in recent years. The lymph nodes of the stomach are collected in 16 groups and are classified from N1 to N3 according to their stations. Parallel to this order of lymph nodes, lymph node dissections are separated from D0 to D3. D0 dissection N1 group lymph nodes were not dissected; D1 dissection dissolves the entire N1; D2 dissection N1 and N2 group lymph nodes all dissected; D3 dissection indicates that all of the lymph nodes of N1, N2, N3. It is concluded that gastric cancer has a poor prognosis and aggressive cancer. The standard treatment is surgery. In the surgical treatment, total / subtotal gastrectomy + D1 (+/-) D2 lymph node dissection +/- omentectomy is performed. D2 dissected +/- omentectomy gastric cancer postoperative radiotherapy, the role of RT in the treatment, the target volume of RT, new RT techniques to reduce the potential toxicity and which group of patients is not clear is clear. The results of a prospective randomized study will provide more reliable results.

Keywords: Radiotherapy; lymph node dissection; gastric cancer; omentectomy.

1. INTRODUCTION

Gastric cancer is the 5th most common cancer worldwide and ranks third in cancer deaths. It is an insidious disease and it is usually asymptomatic until it reaches the advanced stage. Surgical treatment is still standard treatment, although chemotherapy, radiotherapy and immunotherapy have been advancing in recent years. Surgery for gastric tumors is

**Corresponding author: Email: cihany@erciyes.edu.tr;*

applied for curative, palliative or reduction purposes [1-2].

The chance of healing in gastric cancer is only possible with curative surgical resection. Today, curative surgery of stomach cancer is still up to date. Curative resection is the removal of all lymph nodes with pathological metastasis in patients without peritoneal and distant metastasis, together with the stomach and with clean surgical margins. However, the extent of lymph node resection, the limits of stomach and peripheral organ resection, and the effects of complications related to survival on survival are discussed [2-5]. D2 lymph node dissection +/- total omentectomy was performed in gastric cancer and radiotherapy (RT) indications were discussed again. Therefore, the purpose of this review is to address the indications and areas of radiotherapy.

2. MATERIALS AND METHODS

2.1 Curative Surgery in Gastric Cancer

Curative surgery, total / subtotal gastrectomy + D1 / D2 lymph node dissection +/- total omentectomy. One of the integral parts of gastric cancer surgery is broad lymphadenectomy and omentectomy. The lymph nodes of the stomach are collected in 16 groups and are classified from N1 to N3 according to their stations. Parallel to this order of lymph nodes, lymph node dissections are separated from D0 to D3. D0 dissection N1 group lymph nodes were not dissected; D1 dissection dissolves the entire N1; D2 dissection N1 and N2 group lymph nodes all dissected; D3 dissection indicates that all of the lymph nodes of N1, N2, N3 group are dissected [3-8].

2.2 The Importance of Omentectomy in Stomach Cancer

Omentum is a 2-leaf visceral peritoneal fold which is defined as lymphomyeloid tissue. It consists of two mesothelial leaves and connective tissue that connect these leaves, including capillary vessels, adipocytes, fibroblasts and extracellular matrix. Omentum was known as an unusually oily, leaf-shaped tissue that initially caused intraabdominal adhesions after surgery. Omentum plays an important role in stimulating the fluid transport and angiogenesis in the peritoneum, detecting and repairing damaged areas, fighting infections, acting as a stem cell source, producing regulator molecules, and supplying lipid. The omentum also acts as a protective cushion because it is an oily tissue, reduces intestinal adhesion, absorbs impurities. Although omentum appears to be a target organ in seeding metastasis in gastric cancer, it has also been found to limit the spread of tumor cells spilled into the peritoneum. Upon the understanding of all these effects, the interest in the omentum has increased [1-5]. The surgeons were directed to protect the omentum and the necessity of the total omentectomy procedure was questioned. Partial omentectomy has been performed especially in early stage tumors [5].

Omentum metastasis is not expected to be detected in early-stage tumors because it is by sowing. In contrast to early-stage and diffuse diffuse or stony ring cell morphology, partial omentectomy is not enough in patients who are not aggressive. Omentum resection is included in standard surgery in advanced gastric cancer [3-8]. Haverkamp et al. reported that omental lymph node metastasis or tumor deposits were 10% in patients undergoing gastrectomy for gastric cancer, and that omentectomy had a prognostic and oncological value [1]. In the recently published Japanese Gastric Cancer Association, partial omentectomy can be performed in T1-T2 tumors in gastric cancer treatment guidelines, but total omentectomy is the standard in T3 and advanced tumors [2]. In a clinical study conducted by Hasegawa et al., no difference was observed between the patients with advanced gastric cancer and omentectomy group with respect to peritoneal recurrence and disease-free survival. The duration of operation and perop bleeding were higher in the total omentectomy group [4].

2.3 The Role of Radiotherapy in Gastric Cancer with D2 Lymph Node Dissection and/or Total Omentectomy

D2 lymph node dissection +/- total omentectomy was started in gastric cancer and radiotherapy (RT) indication and areas were questioned. In the current NCNN guideline, only adjuvant chemotherapy is recommended in patients dissected with D2. There are conflicting results regarding the fact that the addition of RT to chemotherapy provides more benefit to these patients. Three new prospective randomized controlled trials in South Korea and China (ARTIST, NCC and Multicentered IMRT Studies) have shown that adjuvant chemoradiotherapy (CRT) is effective and safe in gastric cancer

patients with D2 dissection. It has also been shown to be effective in the INT-0116 study in North America. However, the results of the ongoing CRITICS study will clarify which group of patients (such as the E2F-1 and HER-2 subgroup) will be offered RT [9-12]. When we look at this information, the role of RT in the treatment of D2 dissection is not clear. Fan and colleagues reported that CRT after D2 dissection in patients with locally advanced gastric cancer increased disease-free survival and local control. RT was reported to be more effective than N1 stage, especially in N3 stage [11]. Wang et al. reported that the side effect of the simultaneous three-dimensional conformal radiotherapy or dose-modulated radiotherapy (dose of 50.4 Gy / 28f) with FOLFOX in stage stage IB-IIIC gastric cancer patients was low and reliable [12]. In a retrospective study conducted by Li et al., there was no difference in disease-free survival and overall survival between the RT-treated group and the untreated group; They suggested the addition of adjuvant RT in patients with N2 or LNR> 0.65 [13]. In phase 2 study, Haijun et al. identified new regional lymph node stations by reference to gastric gastric growth after D2 dissection. They emphasized that this method is well tolerated and feasible [14].

3. CONCLUSISON

As a result, gastric cancer has a poor prognosis and aggressive cancer. The standard treatment is surgery. In the surgical treatment, total / subtotal gastrectomy + D1 (+/-) D2 lymph node dissection +/- omentectomy is performed. D2 dissected +/- omentectomy gastric cancer postoperative radiotherapy, the role of RT in the treatment, the target volume of RT, new RT techniques to reduce the potential toxicity and which group of patients is not clear is clear. The results of a prospective randomized study will provide more reliable results.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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