



Original Research

Fracture after gastrectomy for gastric cancer: A long-term follow-up observational study



Hyun Jin Oh ^a, Chul-Hyun Lim ^{a,*}, Byung-Ho Yoon ^b, Seung Bae Yoon ^a,
Myong Ki Baeg ^a, Won Chul Kim ^a, Yu Kyung Cho ^a, Jae Myung Park ^a,
Myung-Gyu Choi ^a, Han Mo Yoo ^c, Kyo Young Song ^c,
Hae Myung Jeon ^c, Cho Hyun Park ^c

^a Division of Gastroenterology, Department of Internal Medicine, College of Medicine, The Catholic University of Korea, Republic of Korea

^b Department of Orthopaedic Surgery, Inje University College of Medicine, Seoul Paik Hospital, Republic of Korea

^c Division of Gastrointestinal Surgery, Department of Surgery, College of Medicine, The Catholic University of Korea, Republic of Korea

Received 26 May 2016; received in revised form 8 November 2016; accepted 16 November 2016

Available online 23 December 2016

KEYWORDS

Gastric cancer;
Gastrectomy;
Osteoporosis;
Fracture;
Risk factor

Abstract *Aim:* Gastrectomy is a known risk factor for decreased bone mass. We aimed to evaluate the cumulative incidence and predictive factors of fracture in gastric cancer patients who underwent gastrectomy.

Method: We retrospectively reviewed the records of 1687 patients who underwent gastrectomy for gastric cancer at our hospital between September 1991 and December 2008. The exclusion criteria were stage IV gastric cancer, history of cancer recurrence, medical conditions that cause osteoporosis and high-energy injury. Fractures at sites considered to be associated with osteoporosis were diagnosed radiologically.

Results: In total, our analysis included the records of 1131 patients. The incidence of postgastrectomy fracture was 42.1 cases per 1000 person-years. Fractures typically occurred within 3.7 ± 0.5 years postoperatively. The cumulative incidence of fracture was 9.1%, 19.7%, and 37.3% by postoperative year 2, 4, and 6, respectively. During the following years, the cumulative incidence increased slowly, up to a final 40.6%. Multivariate analysis showed that older age (hazard ratio, 1.03; 95% confidence interval, 1.01–1.04) and smoking (hazard ratio, 1.35; 95% confidence interval, 1.05–1.73) were significantly associated with fracture, whereas sex, body mass index, percent weight loss, diabetes mellitus, tumour stage, and type of gastrectomy were not.

* Corresponding author: Division of Gastroenterology, Department of Internal Medicine, College of Medicine, Seoul St. Mary's Hospital, The Catholic University of Korea, 222 Banpo-daero, Seocho-gu, Seoul 137-701, Republic of Korea. Fax: +82 2 2258 2089.

E-mail address: diluck@catholic.ac.kr (C.-H. Lim).

Conclusion: The cumulative incidence of fracture is high in gastric cancer patients who have undergone gastrectomy, and fracture rate is higher during the early postoperative period. Old age and smoking are independent risk factors for postgastrectomy fracture in these patients. More detailed postoperative surveillance and pharmacological intervention should be considered to prevent fracture.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

Gastric cancer is the 4th most common type of cancer worldwide [1], and the incidence of the disease is especially high in East Asia. Early diagnosis and curative treatment such as gastrectomy can improve the outcomes. In Korea, the survival rate for gastric cancer is over 90% when diagnosed early [2]. However, gastrectomy is a known risk factor for osteoporosis [3–5], and although the pathogenesis has not been fully elucidated, the reported incidence of osteoporosis after gastrectomy ranges from 32% to 42% [3,6,7], which implies a higher risk of fractures. Fractures decrease quality of life, and increase the economic burden on individuals, as well as on society [8–10]. In a large cohort study involving peptic ulcer patients, the incidence of osteoporotic fracture after gastrectomy was up to 70% [6]. However, to date, the incidence, characteristics, and risk factors associated with fracture after gastrectomy have not been studied longitudinally and systemically in a large cohort of gastric cancer patients. Thus, the present study aimed to evaluate the cumulative incidence and predictive factors of postgastrectomy fracture in gastric cancer patients who underwent gastrectomy.

2. Patients and methods

2.1. Patients

From September 1991 to December 2008, a total of 1687 patients with gastric cancer underwent curative gastrectomy at the Seoul St. Mary's Hospital, Seoul, Korea. Gastrectomy was defined as margin-negative surgical resection, with no residual tumour (macroscopically). The exclusion criteria were: age >70 years at gastrectomy regarded as decreasing calcium absorption ($n = 334$) [11,12], postoperative tumour recurrence ($n = 118$), another type of cancer ($n = 33$). Among the remaining 1202 patients, those with another medical condition ($n = 26$) or who underwent surgery ($n = 45$) known to affect bone mineral density were also excluded. Therefore, the records of a total of 1131 patients were included in the final analysis (Fig. 1). Cancers were staged in accordance with the tumour node metastasis classification system used by the Union for International Cancer Control, 6th edition [13]. All

relevant data, including clinical, surgical, and pathological records, were collected retrospectively from the database. The Institutional Review Board of our institution approved this study (KC16RISI0380).

2.2. Follow-up measurements

All included patients were registered and followed-up by the Comprehensive Cancer Institute of Seoul St. Mary's Hospital. The patients were followed-up every 3 months during the first two postoperative years, every 6 months during the next three postoperative years, and annually after the fifth postoperative year. The follow-up program consisted of interim history taking, physical examination, imaging investigations, endoscopic examination, haematology tests and blood chemistry panels. Imaging investigations included chest radiography, abdominal computerised tomography (CT) and bone scintigraphy.

Clinical and laboratory parameters regarding nutritional status, including body mass index (BMI), serum albumin, and serum calcium levels were reviewed at baseline and at one year postoperatively. The percentage of weight loss was calculated as the difference between the baseline and 1-year body weight, divided by the baseline body weight.

2.3. Outcomes measured

Fracture was diagnosed by annual bone scintigraphy, with additional CT, magnetic resonance imaging, or X-ray investigations performed as clinically indicated, at the site of bone pain with or without trauma, or as needed for the differential diagnosis from bone metastasis. All radiographs, bone scans and magnetic resonance imaging scans were analysed for fractures by trained radiologists. Only those fractures at sites considered to be associated with osteoporosis (i.e. spine, coccyx, pelvis, ribs, humerus, forearm, elbow, hip, femur, tibia, fibula, clavicle, scapula, and sternum) were considered in this study. The trauma history of the patients with fractures was investigated to differentiate low-energy trauma fracture (following fall from standing height or less) from high-energy trauma fracture (following fall from a height greater than standing height). Person-years were counted from enrolment to the date of death or the end of follow-up.

Download English Version:

<https://daneshyari.com/en/article/5526307>

Download Persian Version:

<https://daneshyari.com/article/5526307>

[Daneshyari.com](https://daneshyari.com)