Surgical Complications in Salvage Surgery of Patients With Head and Neck Carcinomas Treated With Concomitant Chemoradiotherapy (CCR)

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Introduction: One way of treating head and neck carcinomas is using concomitant chemoradiotherapy (CCR). In this study we will try to evaluate the incidence of complications in rescue surgery after CCR.
Material and method: We have studied data from 103 patients diagnosed as having stage III or IV squamous head and neck carcinoma between 1997 and 2005. They were treated following 2 different CCR protocols.
Results: Of the 103 patients, 26 (25%) required rescue surgery. Eight patients in this group (30.76% of those operated on) presented complications. The average stay in our department was 52.8 days (7-197 days).
Conclusions: Patients treated with CCR who have needed rescue surgery apparently have a higher rate of complications and a longer stay than those treated with surgery alone.

Key words: Concomitant chemoradiotherapy. Rescue surgery. Complications. Pharyngostoma.

Complicaciones quirúrgicas en la cirugía de rescate de pacientes con carcinomas de cabeza y cuello tratados con quimioterapia y radioterapia concomitantes

Introducción: Una de las modalidades de tratamiento de los carcinomas epidermoides de cabeza y cuello es con radioterapia y quimioterapia concomitantes (RQC). En este estudio se intentará evaluar la incidencia de complicaciones que presenta la cirugía de rescate tras la realización de RQC.
Material y método: Se ha estudiado los datos de 103 pacientes diagnosticados de carcinoma epidermoide de cabeza y cuello en estadios III y IV tratados entre 1997 y 2005. Se los trató siguiendo dos protocolos distintos de RQC.
Resultados: De los 103 pacientes, requirieron cirugía de rescate 26 (25%). Dentro de este grupo presentaron complicaciones 8 pacientes (el 30,76% de los intervenidos). La estancia media en el servicio de otorrinolaringología fue de 52,8 (7-197) días.
Conclusiones: Los pacientes que han recibido RQC y han necesitado cirugía de rescate posteriormente presentan una aparente mayor tasa de complicaciones, así como un ingreso más prolongado, que aquellos en quienes inicialmente se opta por la cirugía.

Palabras clave: Radioterapia y quimioterapia concomitantes. Cirugía de rescate. Complicaciones. Faringostoma.

INTRODUCTION

Squamous cell carcinomas are the most frequent anatomopathological variety of head and neck neoformations. The therapeutic options have varied over time, ranging from extremely mutilating surgeries as the only option to the current protocols for organ preservation. One of the protocols followed in the last few years for tumours in advanced stages has been concomitant chemoradiotherapy (CCR) together with eventual "rescue surgery."[1,2] In some studies it has been proven that this method of treatment may increase the survival and organ-preservation rates at 3 years compared with the traditional methods of surgery and radiotherapy or neoadjuvant chemotherapy.[3-6]

The aim of this paper is to study the incidence of complications requiring surgical repair in patients who underwent rescue surgery following initial treatments with CCR protocols.

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Received May 10, 2007.
Accepted for publication September 10, 2007.

MATERIALS AND METHOD

A retrospective study was performed with patients diagnosed as having stage III-IV squamous cell carcinoma in the oral cavity, oropharynx, hypopharynx, or larynx and treated with CCR. The criteria used for inclusion in the study were that the patients were: *a*) candidates for surgery (but the patient refuses any kind of surgery); *b*) not candidates for surgery on medical grounds (age, advanced chronic obstructive pulmonary disease, etc); *c*) inoperable; and *d*) candidates for surgery at stage T4a.

All were treated following 1 of 2 CCR protocols.

Protocol 1

Radiotherapy: 2 fractions per day of 1.2 Gy/fraction, separated by 6 hours. Schedule: 2 weeks of radiotherapy, 1 week without. Total: 6 weeks of radiotherapy, 2 weeks without. Length of treatment: 8 weeks.

Chemotherapy: cisplatin (CDDP): 7 mg/m^2 in a continuous 24-hour infusion on the same days as radiotherapy.

Protocol 2

Radiotherapy: the same schedules as protocol 1.

Chemotherapy: 1 cycle every 21 days. CDDP: 100 mg/m^2.

Once the CCR protocol had been completed, patients were monitored by the ENT department, which decided if rescue surgery was needed, either because of persistence of the disease at a lesser stage or local or regional relapse.

To perform tumour staging in this study we used the 2002 TNM staging system from the American Joint Committee on Cancer (AJCC).

To calculate survival rates, a survival function estimate was carried out using the Kaplan-Meier method.

RESULTS

During the study period, 103 patients were evaluated, 26 of whom met the requirements and were included in the study. Of these 103 patients, 8 were women and 95 were men; their average age was 58.21 years old.

The anatomopathological diagnosis of the patients in our group was squamous cell carcinoma. The most frequent locations were the larynx and oropharynx (Table 1).

Grouped by stage, most of them were in stage IV (80.76% vs 19.23% in stage III) (Table 2).

The relapse types in these 26 patients were: local, 19 patients (73.07%); regional, 3 patients (11.53%); and locoregional, 4 patients (15.38%).

The surgery performed depended on the primary tumour, the location and the type of relapse as well as the patient's general condition. Table 3 lists briefly the types of surgeries carried out.

The average stay in the ENT department was 58.19 days (7-197) (Figure 1).

Of those patients who underwent surgery, 8 (30.76%) had complications requiring surgical repair and 5 patients (19.23%) presented pharyngostomas. Of the 17 patients who

Table 1. Tumour Location

Type of Carcinoma	*Patients, n (%)*
Larynx	9 (34.61)
Oropharynx	6 (23.07)
Hypopharynx	3 (11.53)
Pharyngeo-laryngeal	3 (11.53)
Oral cavity	3 (11.53)
Oro-hypopharyngeal	2 (7.69)

Table 2. Tumour Stage

Stage	*Patients, n (%)*
III	5 (19.23)
IV	21 (80.76)

Table 3. Type of Surgery

Type of Surgery	*Patients, n*
Total laryngectomy	8
Total laryngectomy and elimination of the cervical nodes	2
Total laryngectomy and sub-total glossectomy	2
Buccopharyngectomy through midline mandibulotomy	3
Buccopharyngectomy through midline mandibulotomy and elimination of the cervical nodes	2
Laser exeresis of the lesion	2
Laser exeresis of the lesion and elimination of the cervical nodes	2
Elimination of the cervical nodes	2
Glossectomy	1
Exeresis of a dermal nodule and elimination of the cervical nodes	1
Debriding by radionecrosis	1

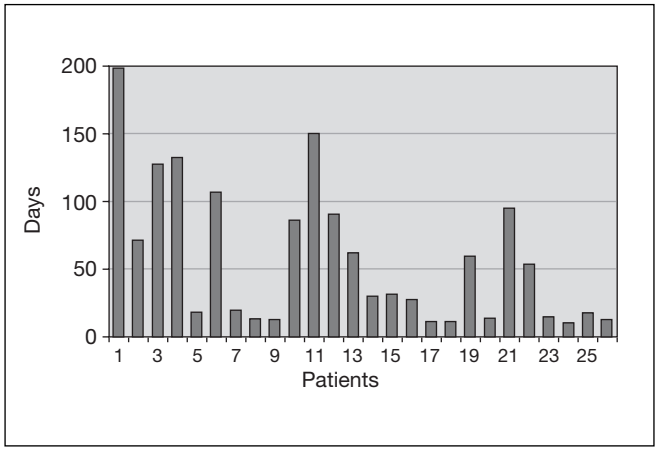

Figure 1. Hospital stay.

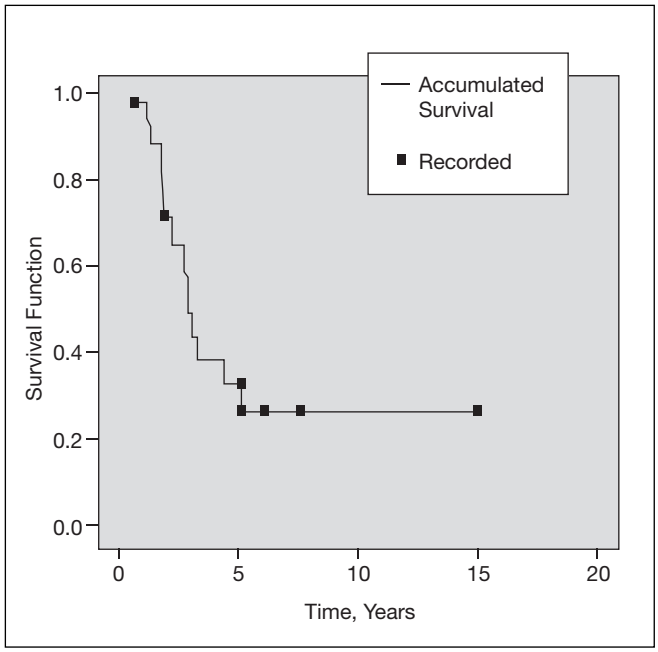

Figure 2. Curve of the survival function.

had their upper aerodigestive tract opened, pharyngostoma (5 cases in 17 patients) occurred in 29.41% of the patients who had surgery.

Other complications seen included a tear in the carotid artery (1 case), a tear in the mandibular osteotomy reconstruction plate (1 case), and cervical osteocutaneous radionecrosis (1 case).

The estimated survival rate according to the Kaplan-Meier (Figure 2) method was 48.1% at 3 years and 33.7% at 5 years.

DISCUSSION

Most of the randomized tests done in the last 2 decades have evaluated chemotherapy together with radiotherapy versus radiotherapy alone as the definitive treatment, without surgery being foreseen at any time or limited only to rescue surgery. Despite this, and unlike the sequential schedule, some of these studies have shown an improvement in the overall survival rate with concomitant chemotherapy.[1,7-10]

This is seen in a randomized study done by Duke University in 1998[11] that compares a group only receiving hyperfractioned radiotherapy against another group with cisplatin CCR and 5-fluorouracil in infusion out of a group of patients with stage T3-T4 squamous cell carcinoma of the head and neck; in the CCR group it was shown that locoregional improvement was attained as well as a higher 3-year survival rate, but along with higher levels of toxicity, especially in the form of mucositis.

The study done by the Groupe d'Oncologie Radiothèrapique de la Tête et du Cou (GORTEC), published by Calais et al[12] in 1999 focuses on patients with oropharyngeal cancer in stages III-IV. It also showed better locoregional control and an improvement in the 3-year disease-free survival rate regarding the group of patients who underwent conventional radiotherapy on its own, but who also showed higher rates of mucositis and the need for nasogastric tube placement.

Another study that also supports the same ideas is that by Milas et al,[13] which states that CCR improves survival rates not only regarding radiotherapy alone, but also with induction chemotherapy.

Most of the studies coincide that this therapeutic strategy allows for better local control of the disease than others, albeit at the cost of a higher prevalence of complications. Present in all these studies are references to the mucositis and dermatitis associated with this type of treatment, occasionally so severe as to require suspension of the treatment. Other frequent complications are dysphagia and aspiration of food into the airway, voice changes, kidney toxicity, haemotoxicity (leukocytopenia, thrombocytopenia, or anaemia),[4,5,14-16] while less frequent complications, such as chondroradionecrosis, may necessitate laryngectomy.

As mentioned above, there are not many papers discussing the role of surgery in these patients. In fact CCR is grouped along with organ-preservation strategies. This is the case of the study conducted for the Cleveland Clinic by Adelstein et al[3,6] on patients with resectable squamous cell carcinoma of the head and neck in advanced stages, which compared the preservation rates of CCR with those of radiotherapy alone, and the former were higher. However, this study also refers to rescue surgery and states that no significant differences were observed with regard to the survival rate and that the frequency of complications after the rescue surgery in response to treatment failure did not significantly increase.

Another article relating CCR and surgery is that of McHam et al[1] that takes on the task of analyzing the need to eliminate cervical lymph nodes after CCR. The article comes to the conclusion that it would be necessary to do so on patients with N2-N3 neck disease since these patients present occult disease in 25% of cases. It reaches a 26%-35% rate of complications following surgery, which is comparable with that of radiotherapy alone.

During our study we have focused on surgical complications, leaving aside some of the other questions raised in the articles mentioned. We have been able to confirm the incidence of complications following rescue surgery (30.76%), which is higher than that in the last article mentioned, even though it only referred to lymph node elimination. Something that must not be overlooked is the incidence of post-surgical pharyngostomas (29.41% of all patients with an opening of the upper aerodigestive tract; according to the literature on the subject the incidence of pharyngocervical fistulae in patients operated on with no previous CCR is 5%-10%, and of those, approximately 50% develop pharyngostomas), even though we cannot generalize this information due to the heterogeneity of the sample and its small size.

It is important to mention the difficulty in finding publications in the current bibliography about post-surgical complications in any type of patient.

It remains to be seen whether or not rescue surgery improves the survival rate of these patients or their quality

of life. These are issues that should be resolved in future studies.

Acknowledgements

We are grateful for the support and collaboration given by Dr Juan Ignacio de Diego Sastre, from La Paz University Hospital in Madrid.

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