Symposium 1 : Pathophysiology of the Hypopharynx and Esophagus in the Geriatric Age Group

Keynote Address

**Carcinoma of the Hypopharynx
in the Geriatric Population**

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The records of 152 patients with carcinoma of the hypopharynx from 1975 to 1986 were reviewed retrospectively. Defining the geriatric population as 65 years or older, 84 patients were excluded by age criteria alone, leaving 68 patients for further analysis. Distribution by site included 58 (85%) pyriform sinus, 9 (13%) posterior pharyngeal wall, and 1 (2%) with a postcricoid lesion. There were 6 (9%) Stage II, 25 (37%) Stage III, and 37 (54%) Stage IV patients. Treatment groups included surgery alone (24%) and surgery combined with either preoperative or postoperative radiation therapy (76%). Lesions of the pyriform sinus were subdivided into lateral wall lesions (LP) and medial wall lesions (MP). Comparisons between these two sites will be made. The most frequent site of failure was in the neck (18%) followed by distant metastases (16%). Three (4%) patients failed locally in the laryngopharynx. Seven ipsilateral failures occurred in the operated neck while five failures occurred in the unoperated contralateral necks. Comparisons between the geriatric group and the overall index population of patients with carcinoma of the hypopharynx will be made.

INTRODUCTION

Traditionally, the hypopharynx is subdivided into the pyriform sinus, postcricoid area, and posterior pharyngeal wall, how-

ever, the lines that divide the hypopharynx into three separate anatomic regions readily overlap one another.¹⁾ Within the pyriform sinus, the medial wall abuts a transitional zone that separates the endolarynx from the exolarynx, a region variably referred to as the lateral epilarynx or marginal zone, which includes the aryepiglottic fold, arytenoid and pharyngoepiglottic fold.

Patients with tumors of the hypopharynx are at high risk for early dissemination of disease into the cervical lymphatics. From 65 to 80 percent¹⁻³⁾ of these patients present with palpable lymph node metastases, and

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30-40 percent^{2,4)} of N₀ necks are subsequently found to have histologic evidence of involvement following elective neck dissection.

Carcinoma of the hypopharynx carries a poor prognosis and numerous reports have been published outlining the unique characteristics of this disease, but very little attention has been focused on its behavior in the geriatric population (patients 65 years of age and older). We have recently reviewed our entire series of patients with carcinoma of the hypopharynx (index population), from which this geriatric data has been derived. It is our intention in this review to address any similarities or dissimilarities that may exist between the geriatric and index populations.

One interesting observation made in the index population is that patients with lesions confined to the pyriform sinus may manifest different clinical behaviors based upon the location of the primary site within the sinus. Patients whose lesions involve the medial wall of the sinus (MP) demonstrated a tendency towards improved survival rates, but higher contralateral neck failure rates, than patients whose lesions were confined to the lateral wall of the pyriform sinus (LP). We examined the data from the geriatric population to determine if this observation is recapitulated in this subgroup of patients.

MATERIALS AND METHODS

The records of all patients diagnosed and treated surgically for squamous cell carcinoma of the hypopharynx between 1978 and 1988 were retrospectively reviewed. The geriatric population was defined as patients 65 years and older. A separate review of the entire population of patients with carcinoma of the hypopharynx had been previously performed and is defined as the index population. It will be used as a basis for comparison. All patients herein reported had at least a two year follow-up or documented death within that period of time. Staging was assigned according to the 1980 American Joint Committee Classification.⁵⁾

The lesions were classified as involving

predominantly the pyriform sinus (PS), posterior pharyngeal wall (PW) or postcricoid region (PC). Lesions of the pyriform sinus were further divided into two groups. Medial pyriform lesions (MP) were defined as any tumor of the hypopharynx that involved the medial wall of the pyriform sinus, inclusive of the marginal zone (aryepiglottic fold, arytenoid or pharyngoepiglottic fold). All others were classified as lateral pyriform (LP) lesions.

RESULTS

A group of 68 patients age 65 or older and treated surgically for carcinoma of the hypopharynx were identified (geriatric population) who were followed for a minimum of 24 months or until death. The index population (for purposes of comparison) consisted of 152 patients. Sixteen patients dead without cancer of causes unrelated to their lesions were deemed indeterminant, and are excluded from survival analysis.

The mean follow-up was 47 months, with a range of 24-168 months. The age range was 65-83, with a mean age of 71 years. The male: female ratio was 5:1. Sixty-eight percent (48/68) of the patients in this study presented with palpable cervical adenopathy.

Pyriform sinus lesions accounted for 58 (85%) of the cases, PW 9 (13%), and PC 1 (2%). The pyriform sinus patients were subdivided into lateral wall lesions (LP), 36 (53%) patients, and medial wall lesions (MP), 22 (32%) patients. One-hundred percent of LP lesions were Stage III and IV versus 79 percent of MP lesions. Six (9%) patients were Stage II, 25 (37%) Stage III, and 37 (54%) were classified as Stage IV when LP and MP groups were combined. Two-year determinant survival rates were 4/5 (80%), 11/18 (61%), and 14/29 (48%) for Stage II, III, and IV respectively. The overall two-year determinant survival rate was 29/52 (56%). Two-year determinant survival rates by site are recorded in Table I.

Surgery alone was performed in 16/68 (24%) patients. Planned preoperative or post-

TABLE I. Two-Year Determinant Survival by Site

LP	10/24 (42%)
PW	5/8 (63%)
MP	13/19 (68%)
PC	1/1 (100%)
Total	29/52 (56%)

operative radiation therapy in conjunction with surgery was performed in 52/68 (77%) patients. Radiation therapy ranged from 26 to 70 Gy. Forty-eight patients received postoperative radiation therapy and four patients received preoperative radiation therapy. Radiation was directed at the primary tumor and the necks bilaterally. Surgical procedures consisted primarily of total laryngopharyngectomy (TLP) or total laryngectomy (TL) with unilateral neck dissection.

Unilateral neck dissection was performed in 58 patients, bilateral neck dissection in 5 patients, and 5 patients underwent no neck dissection. Seven ipsilateral neck recurrences ultimately occurred in 63 ipsilateral, operated necks (11%). All five contralateral neck failures occurred in unoperated necks. Four patients in each of these two groups (57% and 80% respectively) received radiation therapy.

Recurrence at the primary site occurred in three (4.4%) patients in this study population. Distant metastases occurred as the sole cause of failure in 11/68 (16%) patients. The most common site of failure was the lungs (9 patients).

Local-regional failure occurred in 15 (22%) patients overall. The most common site of failure was the cervical lymphatics (12 patients, 18%). Table II depicts the recurrence by site. Local and regional recurrences were similar for each primary site. Table III depicts the breakdown of cervical recurrence by site. For LP lesions, there were six (17%) failures in the ipsilateral, operated neck and one (3%) failure in the contralateral, unoperated neck. For MP lesions, no patients failed in the ipsilateral, operated neck and four (18%) patients failed in the contralateral, unoperated neck. This differential failure

TABLE II. Recurrence by Site

		Local	Neck	Distant
LP	<i>n</i> =36	1 (3%)	7 (19%)	7 (19%)
MP	<i>n</i> =22	1 (5%)	4 (18%)	1 (5%)
PW	<i>n</i> =9	1 (11%)	1 (11%)	3 (33%)
PC	<i>n</i> =1	—	—	—

TABLE III. Impact of Primary Site on Cervical Recurrence

	Total failures	Ipsilateral	Contralateral
LP	7/36	6 (17%)*	1 (3%)
PW	1/9	10 (11%)	0 (0%)
MP	4/22	0 (0%)	4 (18%)*

(* $p=0.034$, X^2)

rate in ipsilateral versus contralateral necks for LP and MP lesions achieved statistical significance ($p=0.034$, X^2). For the pyriform sinus patients as a whole, six (10%) patients failed in the ipsilateral neck and five (9%) patients failed in the contralateral neck. One ipsilateral neck failure occurred in the PW patients. Forty-six (68%) patients had histologically positive nodes and 22 (32%) patients had no evidence of histologic metastases. Two-year determinant survival rates were 43% and 82% respectively ($p=0.017$, X^2). Of patients with histologically positive nodes, 11/46 (24%) failed in the neck versus 1/22 (5%) with negative nodes. Of the patients with positive nodes, 33 (72%) demonstrated evidence of extracapsular spread (ECS). Thirteen (28%) patients had no ECS. The two-year determinant survival rates were 23% and 46% respectively ($p>0.05$, X^2).

Nineteen (37%) patients are alive without evidence of disease, 23 (44%) are dead of disease, 10 (19%) are dead of other causes with greater than 24 months follow-up and no evidence of recurrence. Average time to recurrence was 12.8 months and 88% of the patients manifested their recurrent disease within 24 months.

DISCUSSION

Despite the multitude of reports concerning carcinoma of the hypopharynx over the last several decades, none have specifically analyzed the behavior of this disease in the geriatric population alone. The basic premise of this retrospective review was to examine this subgroup of patients and determine if specific patterns of behavior exist that are unique to this population and can be explained on the basis of their age. We have recently reviewed our experience with cancer of the hypopharynx, and a literature review of the subject revealed our index population to be representative of what is reported elsewhere. Results obtained from analyzing the geriatric group will be compared to our index population of patients with carcinoma of the hypopharynx, and any significant comparisons between the two will be discussed.

Of the 17 patients excluded as indeterminate in the index population, 16/17 were contained within the geriatric group. This likely represents a very specific age-related finding indicative of the high early attrition rate in the elderly secondary to a greater prevalence of morbid, age-related medical conditions. In a similar fashion, the higher male: female ratio (5:1 versus 3:1 in the index population) noted in the geriatric group probably reflects the fact that tobacco and alcohol-related diseases are more prevalent in males in the older age groups.

Overall distribution of patients by site were similar, but when pyriform sinus lesions were divided into LP and MP sites, a higher percentage of LP patients was noted in the geriatric population. The significance of this observation is uncertain. No significant differences were found between the geriatric and index population for the following observations: palpable cervical adenopathy at presentation (68% versus 66%); distribution and survival by stage; treatment groups and survival rates for each group; surgical procedures; incidences and sites of recurrent disease; histologic nodal status and incidence of

ECS.

Overall two-year determinant survival rates were similar (56% versus 64%) as were survival rates by primary sites. However, MP patients (in both groups) demonstrated a trend towards better survival over LP patients (68% versus 42% for the geriatric patients), but this was not statistically significant. This difference in survival rates between LP and MP patients has been reported elsewhere.^{1,6)} Tumor status had no apparent impact on survival or local recurrence rates, but advancing nodal status did demonstrate a trend towards diminished survival.

ECS and nodal disease were important prognostic indicators, as has been previously reported,⁷⁻⁹⁾ but no differences were noted between primary sites. Histologic evidence of nodal disease was associated with a trend towards increased neck recurrence (24% versus 5%) and a statistically significant difference in survival rates (43% versus 82%, $p=0.017$, X^2). A trend was also noted for decreased survival with the presence of ECS (23% versus 46%).

Local recurrence rates for this disease have improved over the last few decades, as evidenced by our rate of 4.4%, and rates reported elsewhere.⁷⁾ Cervical recurrence and distant metastases remain the most significant causes of patient demise with this disease.

Distant metastases occurred in 16% of the geriatric patients, the most common site being the lung. However, regional recurrence accounted for the greatest percentage of treatment failures (18%). No differences in incidence of neck recurrence were noted between anatomic sites. Seven ipsilateral neck failures occurred in 63 operated necks and 5 contralateral failures occurred in unoperated necks. Seven LP and 4 MP patients developed cervical recurrences. Fifty-seven percent and 80% received radiation therapy respectively. Table III outlines the breakdown of cervical recurrence into ipsilateral, operated and contralateral, unoperated neck failures for LP, MP and PW lesions. Ipsilateral and contralateral recur-

rences for LP lesions (17% and 3%) were diametrically opposed to the results for MP lesions (0% and 18%). This difference achieved statistical significance ($p=0.034$, X^2). The same patterns of cervical recurrence were also observed for these anatomic sites in the index population.

This anatomic distinction between LP and MP lesions was made because previous authors have noted that lesions of that portion of the laryngopharynx referred to as the lateral epilarynx or marginal zone, manifest behavior patterns somewhere between those of pyriform sinus and supraglottic carcinoma.^{4,10-12} Although this is a well-recognized and often referred to region,^{3,4,7,10,11} it remains something of an enigma because of its ability to thwart accurate classification. In a recent review of supraglottic carcinoma from this institution, Lutz et al.¹³ noted that lateral supraglottic lesions (which may involve the marginal zone) incur a high risk of contralateral neck failure (17%). Because medial wall pyriform lesions may also involve this marginal zone, we hypothesized that MP lesions might incur a risk of contralateral neck recurrence similar to that of supraglottic carcinoma, which has been demonstrated in this review. This unique characteristic of lesions involving the marginal zone to mimic supraglottic carcinoma has been noted by others.^{1,3,10,12,14}

What are the possible therapeutic implications of this review? First, it must be noted that 8/12 (66%) of the overall neck failures, 4/5 (80%) of the contralateral N_0 necks that failed in the MP group, and 5/6 (83%) of the failed contralateral N_0 necks of the entire geriatric population received radiation therapy. This failure of radiation therapy to control both the ipsilateral, operated and the N_0 contralateral neck is disturbing and has been alluded to by others.^{8,13} Second, of eight salvage attempts in this review, only one was successful (12.5%). We conclude, therefore, that four MP lesions involvement of this marginal zone incurs sufficient risk to the contralateral neck to warrant considering bilateral neck dissections (elective, functional

modified for the N_0 at risk neck) for these patients. Similar recommendations were made by Murakami et al.⁹ in their 1987 review where they found that patients treated with postoperative radiation therapy alone had a much higher incidence of contralateral neck failure than patients treated with bilateral neck dissection. We concur with their findings, but found in our review that this behavior appears to be confined to lesions of the medial wall of the pyriform sinus. Unfortunately, bilateral neck dissection carries a significantly higher morbidity and mortality in the geriatric age group. However, the lower morbidity and mortality associated with highly selective, functionally modified neck dissections may be acceptable even in this elderly, high-risk population. Unilateral neck dissection is indicated for all other anatomic sites within the hypopharynx as outlined in this review.

CONCLUSIONS

1) The most notable difference between the geriatric group and the index population concerned demographic characteristics.

2) The strong association of patients DOC with less than 24 months follow-up is indicative of the higher medical risk associated with the geriatric population.

3) The most frequent site of failure was in the neck.

4) A trend towards better survival was noted for lesions of the medial wall of the pyriform sinus.

5) Radiation therapy alone was not effective in preventing contralateral neck recurrence for medial wall pyriform sinus lesions.

6) Eight of twelve (66%) of the neck failures had radiation therapy to fields of recurrence.

7) The risk of failure in the contralateral, unoperated neck is significantly higher for lesions involving the medial wall of the pyriform sinus.

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