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RADIOLOGICAL AND PATHOLOGICAL CORRELATION IN STAGING OF CARCINOMA LARYNX

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ABSTRACT

BACKGROUND Staging of primary carcinoma of the larynx play an important role in surgical management of the disease .This staging depends on the clinical finding and radiological examination, supported by pathological assessment of the excised tumor.

METHOD A total of 20 patients were studied retrospectively. Preoperative staging protocol included indirect laryngoscopy, direct microlaryngoscopy and contrast enhanced CT scan. The histologic findings were compared with the clinical findings and the CT scan MR images. The impact of each diagnostic method on pretherapeutic staging was analyzed.

RESULTS The CT staging of laryngeal carcinoma showed very high accuracy in staging subglottic and supraglottic tumours (100%), (77.7%) respectively in comparison to clinical staging and lower accuracy (66.66%) in staging glottic tumours. Underestimation of all tumours was 15% of cases (especially small and superficial lesions).

CONCLUSION The accuracy of clinical staging decreased from glottic to supraglottic to subglottic tumours. Conversely, the staging accuracy of sectional imaging is best in subglottic tumours and supraglottic tumours and lower in glottic tumours.

KEYWORDS : Intra Aortic Balloon Pump, IABP, Peri operative Heart failure, Circulatory assist, Severe LV dysfunction

INTRODUCTION

The most important factor in treatment planning of laryngeal carcinoma is the accuracy of staging. But, the staging of the primary tumor is most accurately reflected in the postsurgical (pT) classification, based on histopathological analysis of the resected specimen. The clinical staging of the primary tumor is based on all information available prior to treatment, including the finding at physical examination, endoscopy, and sectional imaging.The limitation of clinical and endoscopic tumor evaluation to assess the exact tumor extension of laryngeal carcinomas is well recognized. The subglottic region and the anterior commissure may be hidden by bulky tumors. Deep tumor extension, such as infiltration of paraglottic and preepiglottic spaces, cartilaginous skeleton, and extralaryngeal structures, cannot be evaluated by endoscopy. Since 1976, computed tomography (CT) has become the most important radiologic adjunct in the pretherapeutic staging of laryngop hary ngeal cancer1 . But, CT scanning of the larynx has its limitations, especially in determining cartilage invasion due to the irregular mix of calcified, ossified, and noncalcified cartilage2,3,4. However, neoplastic invasion of the laryngeal cartilage may have major therapeutic implications. Cartilage involvement reduces the chances of radiotherapy being successful as primary modality. The purpose of the present study was to assess the accuracy of the preoperative CT scan by comparing with histologic cross-sections of the surgical specimen.

PATIENTS AND METHODS

It was a retrospective study done on 20 patients with laryngeal cancer who were operated in head and neck oncosurgical units at our institute. All the patients were male with squamous cell carcinoma of larynx. Each patient was examined and staged by clinical examination and computed tomography. The clinical examination included rigid laryngoscopy under general anesthesia. All these patients then underwent total laryngectomy. Specimens were sent for histopathological evaluation and pathological staging was done.The clinical staging and CT scan findings were then correlated with the histopathological findings. The findings were deemed accurate when the T stage was similar or were labelled overestimate or underestimate accordingly if the T stage were different.

RESULTS

TABLE 1: Accuracy of clinical staging

Clinical tumor staging	Histopathological Staging			
	T1, T2	%	T3, T4	%
Accurate	3	75%	9	56.25%
Underestimate	1	25%	6	37.5%
Overestimate	0	0%	1	6.25%
Total	4	100	16	100

TABLE 2: Accuracy of radiological staging

Radiological tumor staging	Histopathological Staging			
	T1, T2	%	T3, T4	%
Accurate	2	50%	14	87.5%
Underestimate	2	50%	1	6.25%
Overestimate	0	0%	1	6.25%
Total	4	100	16	100

TABLE 3: Accuracy of tumor staging according to tumor location

Radiological tumor staging	Tumor location					
	Supra glottis	%	Glottis	%	Subglo ttis	%
Accurate	7	77.77%	4	66.66%	5	100%
Underestimate	1	11.11%	2	33.33%	0	0%
Overestimate	1	11.11%	0	0%	0	0%
Total	9	100	6	100	5	100

Both CT scan and clinical staging are highly specific to predict the advanced stage (100%) but the sensitivity of clinical stage to predict advanced stage was lower than that of CT scan (79% vs 89%).

DISCUSSION

Overall accuracy of CT scan and clinical evaluation in tumour staging is shown in tables:1, 2 and 3. In our series we found the overall accuracy of CT scan in tumour staging was 80% and for clinical staging was 60%. This is nearly the same results with that obtained by Katsantonis et al (1986)5, who reported preoperative CT and clinical staging accuracy of 82%, 72%, respectively. Vogl et al (1991)6 reported preoperative clinical staging accuracy of 64% for

laryngeal carcinomas. Thabet et al (1996)7, reported overall accuracy in tumour staging by clinical evaluation 52% and CT scan 68%. Becker (1997)8, and Zbaren (1996)9 reported preoperative clinical staging accuracy for laryngeal carcinomas of 58% , 57.5% respectively. Ferri T(1999)10 found the staging accuracy of laryngoscopy vs CT scan was 51.3% , 70.1%, respectively. Differences in our results from those of previous studies might be explained by the presence of a large number of superficial and small mucosal tumors in their series,which lowered CT accuracy, and a large number of T3 and T4 tumors which lowered CE accuracy.

In our series, we found very high accuracy in radiological staging of supraglottic and subglottic tumours (77.77 %), (100 %) respectively in comparison with. glottic tumors (66%). Katsantonis et al (1986) showed also high CT scan staging accuracy of 83% for supraglottic, and 88% for subglottic tumors. Thabet et al (1996) reported preoperative CT staging accuracy of 68% for supraglottic, and 88% for subglottic tumors. In our series, CT scan showed lower accuracy (75%) in staging glottic tumors, which is the same results of: Katsantonis et al (74%), and higher than: Thabet et al (1996) who reported lower accuracy (46%) in staging glottis tumors..

Harrison (1970)11 reported clinical evaluation underestimation of the lesion extent in 40% of his patients. Pillsbury and Kirchner (1979)12 reported inaccurate clinical evaluation staging versus pathological staging for 40% of all tumors in their series, including 37% for glottic, 38% for supraglottic, 50% for transglottic and 13% for subglottic. Sulfaro et al (1989)13 reported inaccurate clinical evaluation staging for 41% of laryngeal tumours. In Thabet et al (1996) there was inaccurate clinical evaluation staging for all tumors 48% including 55% for supraglottic, 15% glottic, 68% transglottic, in the inaccurately staged cases, underestimation occurred in majority of patients. In our series, an inaccurate clinical evaluation staging for all tumors was (33.3%), and for each tumor location was : supraglottic (38%), glottic (16.7 %) and subglottic (44%), in the majority of the cases that were staged inaccurately, the error was one of underestimation. This rate was similar to that reported by: Pillsbury and Kirchner (1979) and Thabet et al (1996). This underestimation resulted from difficulty in clinical evaluation of cartilage invasion, laryngeal space invasion, and extralaryngeal spread when fixed vocal cords were not present. Therefore, high rates of T3 and T4 laryngeal tumours were underestimated by clinical evaluation.

In our series, an inaccurate CT scan staging for all tumours was (20%). In the majority of the cases that were staged inaccurately, the error was one of underestimation: in particular, tumours confined to the mucosa and early infiltration of laryngeal fat spaces was not detected by CT. This is comparable to the results obtained by: Katsantonis et al (1986) , and less than that reported by: Thabet et al, understaging in 20% of cases and overstaging in 12% of cases In our series, CT scan was taken about one week after biopsy which make overestimation of small percentage and lower than Thabet et al, who send their patients for CT scan one week after biopsy taking.

CONCLUSION:

The accuracy of clinical staging decreased from glottic to suprag lottic to subglottic tumours. Conversely, the staging accuracy of sectional imaging is best in subglottic tumours and supraglottic tumours and lower in glottic tumours.

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