

# RADIATION TREATMENT OF EARLY VOCAL CORD CARCINOMA. EIGHTEEN YEARS EXPERIENCE AT "INSTITUTO DE ONCOLOGIA Y RADIOTERAPIA DE MAR DEL PLATA"

Hernán Castro Vita

Unidad de Radioterapia Oncológica e Hipertemia - Ituzaingó 575, 5000 Córdoba, Argentina.

## SUMMARY

A detailed retrospective analysis of 260 patients with T1 NO MO vocal cord carcinoma treated at "Instituto de Oncología y Radioterapia de Mar del Plata" from 1967 to 1985 was performed. The majority of the patients were in the age range of 50 to 79 years, and 79 % were males. The overall observed three year tumor free survival was 85.3 %. When survival rate was adjusted for intercurrent disease and second primary tumor death, the 3 year tumor free survival was 92 %. Sixty two percent of the patients (17/27) undergoing surgical salvage for recurrence, were controlled. Second primary tumors were seen in 18 patients (6.9 %). It is emphasized the importance of close follow up to diagnose as early as possible both the vocal cord recurrence and the second primary tumors.

Key words: Vocal cord carcinoma -  
Radiotherapy in vocal cord tumors.

## INTRODUCTION

The most common presentation of laryngeal cancer is well differentiated squamous cell carcinoma of the vocal cord. Because its manifestation of disease by hoarseness of voice, glottic carcinoma is discovered usually very early, and is therefore a highly curable malignant tumor. Laryngeal cancer ranks among the most common tumors in Argentina's male population. Radiation therapy (RT) is accepted in Argentina and the rest of the world as a primary treatment modality for early

carcinoma of the vocal cord. This study represents the 18 years experience in the management of early vocal cord cancer treated with RT at the "Instituto de Oncología y Radioterapia de Mar del Plata" (IORMP).

## MATERIAL AND METHODS

The records of 260 patients with the diagnosis of squamous cell carcinoma of the vocal cord stage I (T1, N0) treated in IORMP were retrospectively reviewed. They were all treated with RT with curative intent from January 1967 to December 1985. The staging was performed using the 1983 American Joint Committee (AJCC) staging system<sup>1</sup>.

A T1 classification of the primary tumor means: tumor confined to the vocal cords (may include involvement of one or two vocal cords, with or without anterior or posterior commissures extension) with normal mobility. The T1a lesions are those located in the anterior 2/3 of the cord and /or those confined to anterior commissure; the T1b lesions are those that involve the entire cord and /or the posterior aspect of the cord. There were 200 patients T1a and 60 patients T1b.

The majority of the patients were in the 50 to 79 age groups. Ninety percent were males. Most of these patients (91%) were heavy smokers; and 52% were both heavy smokers and drinkers.

The patients were referred from different physicians, usually ENT (ear, and throat) specialists from Mar del Plata. All patients underwent a complete clinical evaluation in the IORMP, including a physical examination and indirect laryngoscopy. In most cases a



lateral soft tissue x ray of the neck was done. Laryngograms as well as tomograms of the larynx were performed in some occasions. In 20 patients 7.7% both vocal cords were involved and 59 patients (29% of T1a patients) showed involvement of anterior commissure.

All patients have microscopic diagnosis of invasive squamous cell carcinoma. One hundreds and twenty three patients were grade 1 (47%), 82 patients (31%) were grade 2, 20 patients (7%) were grade 3; and in 35 patients differentiation was not stated in the pathology report.

The survival rates were calculated by a direct method<sup>2</sup> at 3 years and corrected for intercurrent disease and death for second primaries. Minimal follow up was 3 years and the survival was considered from the initiation of RT to death or December 1988.

Radiation treatments were delivered with megavoltage (Co 60 unit) at a source skin distance of 60-80 cm. The technique of RT consisted in 2 lateral parallel opposed open fields with wedges measuring 5 x 5 cm or 6 x 6 cm, in the majority of the cases.

The radiation dose ranged from 5800-7200 cGy, however most of the patients received at the center of the field 6400-7000 cGy in 6 to 6.5 weeks.

Patients were followed up monthly during the first year, and every 2-3 months during the second and third year.

## RESULTS

The 3 year no evidence of disease (NED) survival can be seen in Table I. Seventy nine per-cent (205/260) of the patients survived at least 3 years with control of the primary tumor having had RT as the only treatment. Another 17 patients were controlled by surgical salvage (12 patients underwent total laryngectomy; 3 patients hemilaryngectomy and 2 patients cricoidectomy). The overall survival NED at 3 years was 85.3% (176/200). The patients who died of intercurrent disease and those dying of second primary tumors

without glottic cancer were withdrawn from the risk of dying and the survival rates at 3 years NED was as follows; T1a patients: 94% (176/187), T1b patients: 85% (46/54), and both groups: 92% (222/241).

Local failure at 3 years is tabulated in the Table II. Nineteen patients (8%) failed to RT. Most of them (30/36 = 83%) did so in the first 18 months following initial RT. Only 3 patients developed node disease with primary failure as well.

Sixteen patients failed in the original cord, whereas 3 patients did so in the opposite cord. These 3 patients were considered in the group of primary treatment failures and not in the group of second primary tumors.

The difference in survival and local control rates between the 2 groups (T1a vs. T1b) was not statistically significant.

Eighteen patients (7%) developed second primary tumors within 36 months of the initial diagnosis. Thirteen of them died because of the second primaries, and in the other 5 patients the second primaries were controlled for a period ranging between 12 and 64 months with further treatment.

The location of the second primaries was as follow: 9 cases in the lung, 4 cases in oropharynx, 2 cases in esophagus, 1 case in the skin, 1 case in kidney and 1 case in lymph nodes (lymphoma).

There were 5 patients who developed a second primary tumor more than 3 years after initial diagnosis. These patients were not analyzed in this report.

Acute and chronic complications are showed in Table III. Most of these complications were mild and the great majority of the patients maintained a useful voice.

## DISCUSSION

There are several series reporting the success of RT in the management of early vocal cord carcinoma<sup>3,4,5,17,19,22</sup>. Our results were similar to those reported by other<sup>19,22</sup>. The preservation of an essentially normal voice is an advan-



tage of RT over surgery. Most failures after radiation may be salvaged by surgery, and on occasions by even a limited procedure with a preservation of good speech. In fact, in the present surgical procedures after RT failure. Five of the 17 patients who underwent conservative operations, retained a usable voice. It must be emphasized the importance of close follow up to diagnose the local recurrence as early as possible. The earlier the recurrence the better the chance of achieving a successful salvage operation.

The RT results were analyzed according to the location of the lesions on the cord. The lesions involving the anterior two-thirds of the cord and/or anterior commissure (T1a) had a higher 3 year NED survival rate as compared to the lesions arising from the cord (T1b) (88% vs. 80%). the posterior cord or entire length. However, the difference was not statistically significant and no definitive conclusions could be stated in this regard.

Since the treatment schedules were very homogeneous (and similar to those reported in the literature), no comparison between different programs of RT (dose-time relationship) could be performed.

The detection of second primaries is another reason for mandatory close follow up in these patients.

In summary: vocal cord carcinoma in early stage is a highly curable disease that should be treated initially with RT. If RT failed, the salvagability with surgery is quite possible, provided that the recurrence is detected early.

#### BIBLIOGRAFIA

1. American Joint Committee on Cancer. Manual for staging for cancer (Second Edition) Phila. J. B. Lippincott, 1983.
2. Berson J., Gage R. P.: Calculation of survival rates for cancer. Proc. Staff Meet Mayo Clin. 25: 270-286, 1950.
3. Baclesse F.: Carcinoma of the larynx. Br. J. Radiol. Suppl 3, 1949.
4. Ballantyne A. J.: Surgical management of radiation failures of nonfixed cancers of the glottic region. Am. J. Reent. 120: 164-168, 1974.
5. Bosch A., et al.: Failures after irradiation in early vocal cord cancer. Laryngoscope. 88: 2017-2021, 1978.
6. Constable W. C., et al.: Raditherapeutic management of cancer of the glottis. Univ. of Virginia, 1956-1971. Laryngoscope. 85: 1494-1503, 1975.
7. Ennuyer A., Bataini P.: Layngeal carcinoma. Laryngoscope, 85: 1467-1476, 1975.
8. Fayos J. V.: Carcinoma of the endolarynx: results of irradiation. Cancer. 35: 1525-1532, 1975.
9. Fletcher G. H. et al.: Reasons for irradiation failure in squamous cel carcinoma of the larynx. Laryngoscope. 85: 987-1003, 1975.
10. Harwood A. R., et al.: Radiotherapy of early glottic cancer. Int. J. Rad. Onc. Biol. Phys. 5: 473-476, 1979.
11. Hawkins N. V.: The treatment of glottic carcinoma: an analysis of 800 cases. Laryngoscope. 85: 1485-1493, 1975.
12. Jorgensen K.: Carcinoma of the larynx. Acta Radiol (Ther). 13: 446-464, 1974.
13. José B., et al.: Management of early glottic cancer. 17: 163-168, 1981.
14. Kirchner J. A., Owen J. R.: Five hundred cancers of the larynx and pyriform sinus. Results of treatment of radiation therapy and surgery. Laryngoscope. 87: 1288, 1977.
15. Mills E. E. D.: Early glottic carcinoma: factors affecting radiation failure results of treatment and sequelae. Int. J. Rad. Onc. Biol. Phys. 5: 811-817, 1979.
16. Mittal B., et al.: Role of radiation in the management of early vocal cor carcinoma. Int. J. Rad. Onc. Biol. Phys. 9: 997-1002, 1983.
17. Olszewski S. J., et al.: The influence of field size treatment modality, commisure involvement and histology in the treatment of early vocal cord cancer with irradiation. Int. J. Rad. Onc. Biol. Phys. 11: 1333-1337, 1985.
18. Rubin P., Bakemaier R., Salayar O., and Castro Vita H.: Oncologia Clinica. Edimed, 1985.
19. Sung D. I., et al.: Primary radiation therapy for carcinoma in situ and early invasive carcinoma of glottic larynx. Inr. J. Rad. Onc. Biol Phys. 5: 467-472, 1979.
20. Wang C. C.: Treatment of glottic carcinoma by megavoltage radiation therapy. Am. J. Roent. 120: 157-173, 1974.
21. Wang C. C.: Cancer of the larynx. Five year results with emphasis on radiotherapy. New Engl. J. Med. 252: 743-747, 1955.
22. Wang C. C.: Radiation therapy for head and neck neoplasms. John Wright. PSG Inc. Bristol. London, 1983.



## RESUMEN

Se realizó un detallado estudio retrospectivo de 260 pacientes con carcinoma de cuerda vocal tratados en el "Instituto de Oncología y Radioterapia de Mar del Plata" desde 1967 a 1985. La edad de la mayoría de los pacientes oscilaba entre los 50-79 años y el 75 % eran de sexo masculino. La tasa de sobrevida global libre de tumor a los 3 años fue del 85,3 %. Cuando la tasa de sobrevida se ajustó por muertes acaecidas por enfermedad intercurrente y

tumores segundo primarios, la sobrevida libre de tumor a los 3 años fue del 92 %. Se controlaron localmente el 62 % de los pacientes (17/27) sometidos a cirugía de rescate. En 18 pacientes se diagnosticó tumores segundo primarios (6,9 %). Se enfatiza en este artículo la importancia de un celoso seguimiento para diagnosticar lo más tempranamente posible a la recidiva tumoral y a los tumores segundo primarios.

Palabra clave: Cáncer de cuerda vocal - Radioterapia en tumores de cuerda vocal.

TABLE I — Three year NED " rates following radiotherapy for T 1 N 0 carcinoma of glottis

Substage (cord mobility normal)	Nº of cases	NED after RT	Surgical salvage	Overall NED 1	Nº NED. Pts with Retained larynx
T 1a° (anterior 2/3 and/or anterior commissure)	200	161/200 (80%)	15*/20 (75%)	176 <sup>α</sup> /200 (88%)	166/200 (83%)
T 1b° (entire cord and/or posterior cord)	60	44/60 (73%)	2*/7 (28%)	46**/60 (80%)	44/60 (73%)
Total	260	205/260 (79%)	17/27 (63%)	222/260 (85%)	210/260 (81%)

NED: no evidence of disease.

\* Five Pts. were salvaged with larynx conservation: 3 pts. underwent hemilaryngectomy, and 2 pts. underwent cryosurgery.

Two patients rescued by total laryngectomy.

<sup>α</sup> Seven patients died for intercurrent disease with primary tumor controlled; 2 patients died for intercurrent disease with primary uncontrolled. Six patients died for second primary tumors with primary controlled.

\*\* Four patients died of intercurrent disease with primary tumor controlled; 7 patients died for second primaries: 2 of them with primary tumor controlled, and the other 5 with primary uncontrolled.

According to criteria of Wang <sup>22</sup>.

TABLE II — Local failure at 3 years (All patients)

END POINTS	Nº OF PATIENTS AT RISK	LOCAL FAILURE (%) (T)	REGIONAL FAILURE (%) (N)
Failure to irradiation	241	36/241 (14.9)	3 <sup>°</sup> /241 (1.2)
Failure after salvage by surgery	241 *	19/241 (8)	1/3 (33)

\* Patients dying for intercurrent disease or second primary tumors (19 patients) were not included in this analysis.

The 3 patients failed in T as well (failure TN concomitantly).



TABLE III - Complication of radiation treatment

COMPLICATION	Nº PATIENTS	(%)
<b>ACUTE</b>		
Dysphonia <sup>x</sup>	210	80
Radiation pharyngitis	198	76
Arythenoid edema	38	14.6
<b>CHRONIC</b>		
Permanent dysphonia	100	38
Arythenoid edema	20	7.7
Radiochondronecrosis <sup>xx</sup>	1	0.4
Subcutaneous fibrosis <sup>o</sup>	33	12.6
Telangiectasis of the cord	21	8
Laryngeal fibrosis with stenosis <sup>+</sup>	1	0.4

<sup>x</sup> Difficult to differentiate if due to tumor of RT.

<sup>xx</sup> With recidiva.

<sup>o</sup> Asymptomatic and clinically non significant.

<sup>+</sup> A tracheostomy was necessary.