



Body Mass and Muscle Variations in locally advanced Oropharyngeal carcinoma during definitive chemoradiotherapy: Clinical Implications for an Adaptive Radiation Strategy

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Background

PERSPECTIVE

Impact of weight loss in patients with head and neck carcinoma undergoing radiotherapy: is it an underestimated phenomenon? A radiation oncologist's perspective

J Cacicedo^{1,2}, A Dal Pra³, F Alongi⁴ and A Navarro⁵

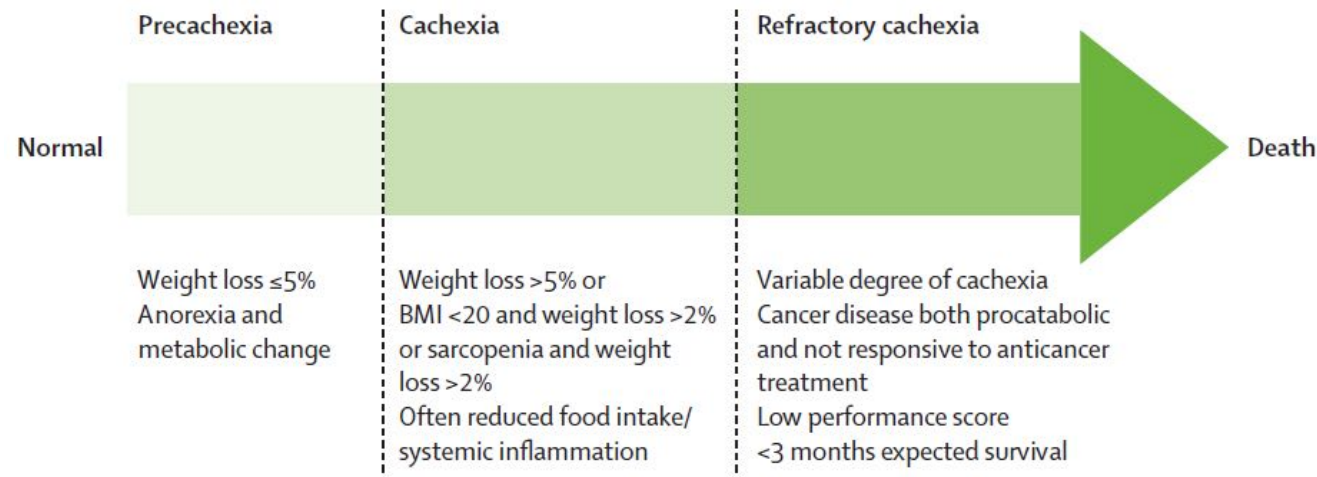
European Journal of Clinical Nutrition (2015), 1–4

Patients affected by **Oropharyngeal** cancer are at relevant risk for **body mass changes** during chemo-RT, only partially compensated by nutritional support*

*In several cases, WL seems to depend on **Cachexia**, a paraneoplastic syndrome characterized by increased catabolism, which plays a direct role in **WL** and **Muscle Atrophy***

Background

Definition and classification of cancer cachexia: an international consensus



Cachexia represents a spectrum through which not all patients will progress. At present there are no robust biomarkers to identify those precachectic patients who are likely to progress further or the rate at which they will do so. Refractory cachexia is defined essentially on the basis of the patient's clinical characteristics and circumstances.

Study Design

Clinical implications of **Body Mass Variations**, including **Sternocleidomastoid Muscle** and **Neck Diameters changes**, as proposal for an adaptive strategy during definitive chemo-RT in locally advanced Oropharyngeal cancer



Patients and Methods

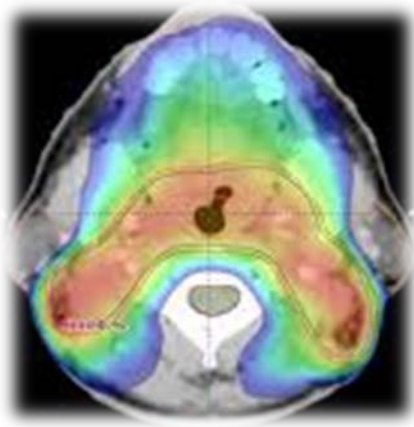
Factors		%	No. Patients
Sex	Male	76	23
	Female	24	7
Age	Median 64 y	Range [33-70]	
T-stage	T1	6	2
	T2	50	15
	T3	27	8
	T4	17	5
Neck nodes positive	None	13	4
	Unilateral	17	5
	Bilateral	70	21
Radiation Technique	IMRT	27	8
	VMAT	73	22
Median Pre-Treatment Weight	Median 71 Kg	Range [60-95]	
Median End of Treatment Weight	Median 68 Kg	Range [57-83]	
Acute Mucositis	G1	23	7
	G2	37	11
	G3	40	12
Acute Dysphagia	G0	3	1
	G1	23	7
	G2	54	16
	G3	20	6
PEG Insertion		13	4

- 30 Patients were selected

Inclusion Criteria

- 1) Age > 18 years
- 2) Histologically proven squamocellular carcinoma of the oropharynx
- 3) Locally advanced disease
- 4) Definitive chemo-RT
- 5) **No MRI evidence of SCM tumor infiltration**
- 6) Eastern Cooperative Oncology Group performance status 0-1

Methods

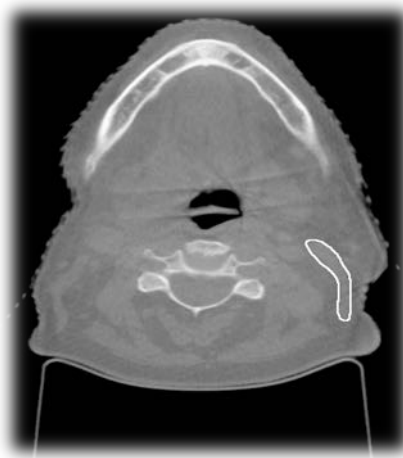


- 70 Gy (33-35 Fr) PTV (T)
- 59.94 - 63 Gy PTV (HR)
- 54.45 - 58.1 Gy PTV (LR)

Cisplatin 100 mg/ m2 q21

Neck Diameters

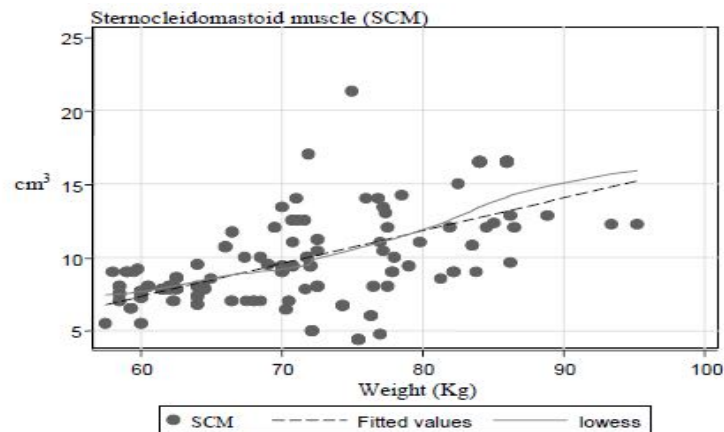
- 1) Encompassing the caudal margin of lateral process of C1
- 2) Encompassing the upper limit of hyoid bone



SCM Definition

- 1) Retrospectively contoured on kV-CBCT by a single observer and reviewed
- 2) Contralaterally to the dominant side
- 3) Defined from the mastoid tip down to the clavicle, using a soft tissue window (+1600 HU/-800 HU)

Results - SCM Changes

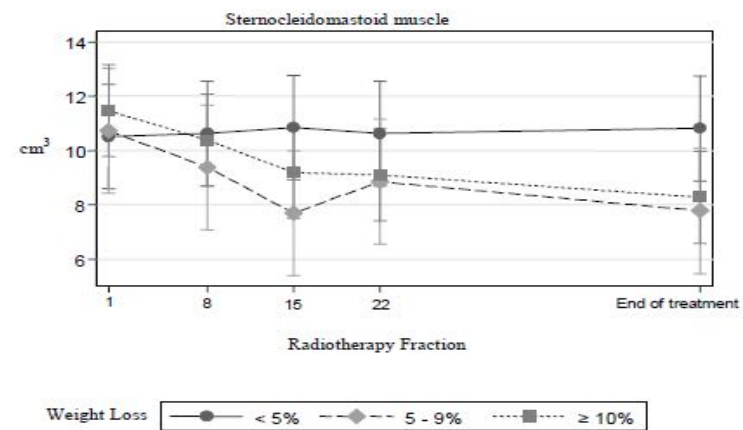


WL influences **SCM** volumetric changes
(p .001)

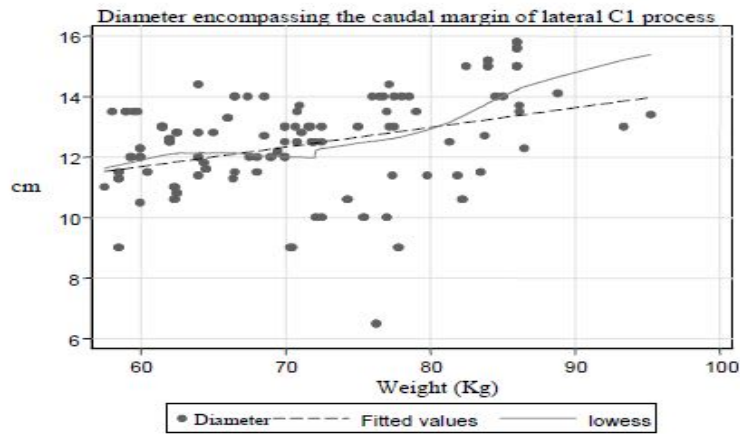
Mean reduction of **-15%** or **-1.6 cc** at **15[^] fr**
Mean reduction of **18%** at the **last fr**

WL 5-9%

Peak of SCM shrinkage at the **15[^] fr** (p.001)



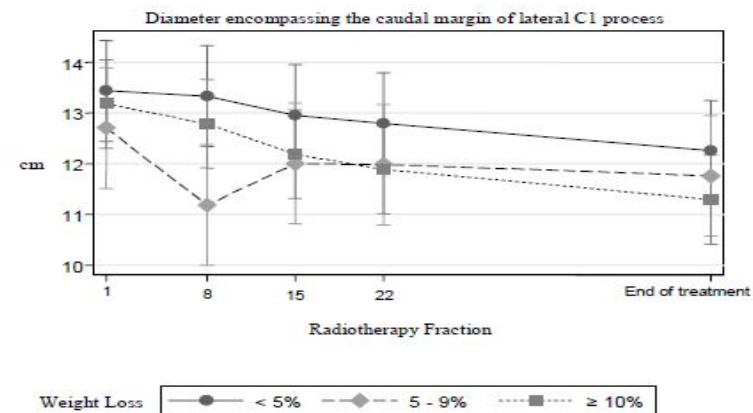
Results – Neck Diameters Changes



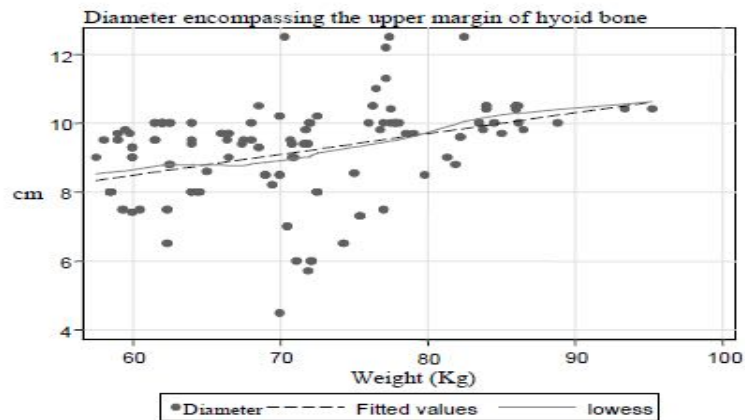
WL influences *neck diameter encompassing the caudal margin of lateral process of C1 modifications* ($p < 0.001$)

Mean value of -0.8 cm at the 15th fr

WL 5-9%
A non-linear changing attitude



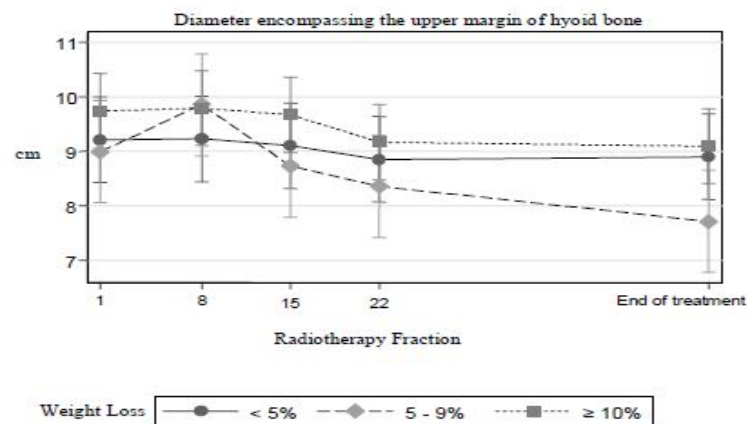
Results – Neck Diameters Changes



WL influences *neck diameter encompassing the upper margin of hyoid bone* modifications (p 0.001)

Mean value of *-0.6 cm* at the 22th fr

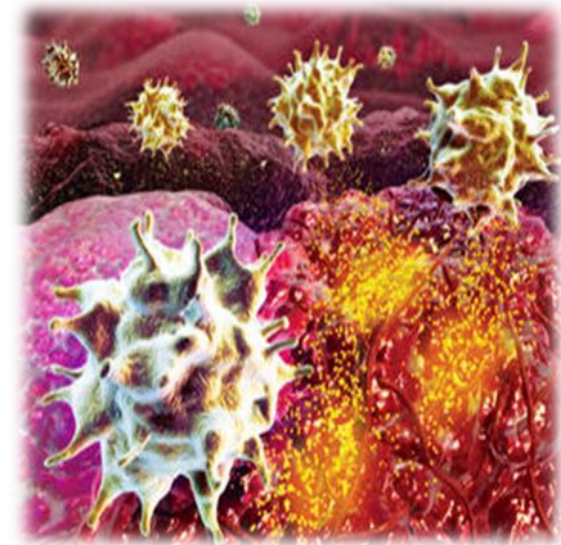
WL > 5%
Diameter gradually reduced until the end of chemo-RT



Clinical Results

**Oral Mucositis \geq G2 was correlated to
WL $>$ 5% (p .005)**

*A protein deficit could impact on the oral mucosa
recovery**



*Patients with sarcopenia seem prone to toxic effects during anti-neoplastic therapies**

Conclusions

*La 15-22[^] fr seems a critical moment for **Body Mass Variations**, including **Sternoscleidomastoid Muscle** and **Neck Diameters** changes*

*Beside the clinical implications of **cachexia** induced by chemo-RT, the present data could provide **adaptive implications** in locally advanced oropharyngeal cancer*

*The quantitative changes of **SCM** and **neck diameters**, could be useful to evaluate the **dosimetric impact** on II-III neck nodal levels dose coverage, in this setting of patients*

THANKS FOR ATTENTION!

