Endoscopic Laser Surgery in flogistic disease and inoperable cancer of the esophagus

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RIASSUNTO

Gli autori espongono la propria esperienza nel trattamento delle stenosi flogistiche e neoplastiche dell'esofago. Essi hanno utilizzato la laser chirurgia endoscopica (ELS), da sola o associata ad altre metodiche, per fotocoagulare e vaporizzare le stenosi vegetanti endoluminali ottenendo una ricanalizzazione di vario grado dell'esofago. Dopo un accurato staging essi hanno applicato la tecnica in 120 pazienti, affetti da disfagia di grado medio-elevato ad eziopatogenesi multipla, considerati inoperabili per la chirurgia open.

Con l'impiego di ELS si è ottenuto una totale ricanalizzazione del viscere nel 100% dei casi ad eziopatogenesi benigna, e negli altri casi ad eziopatogenesi neoplastica si è ottenuta una significativa riduzione del grado disfagico.

Riferendo delle complicanze e anche del rapporto costo-beneficio e comparandolo alla chirurgia tradizionale e/o ad altre metodiche palliative, gli autori concludono auspicando una maggiore collaborazione dei centri specialistici per ottenere un aumento della sopravvivenza e un significativo miglioramento della qualità della vita con l'applicazione di un protocollo comune.

PAROLE CHIAVE: laser chirurgia, endoscopia, neoplasia, esofago, disfagia.

SUMMARY

Background: the purpose of this study was to reduce the high grade of the disphagia and to improve the quality of life in patients affected by the stenosis of the oesophagus using endoscopic laser surgery (ELS).

Methods: from 1988 to 1999, authors observed 135 patients affected by disphagia for flogistic disease and non-operable oesophageal cancer. 15 patients were treated by esophagectomy with immediate or tardive reconstruction. 120 non operable patients were treated with E.L.S. alone or associated with other treatments (dilatations, endoprosthesis, X-ray therapy).

Results: we obtained the recanalization in the 100% of patients with dysphagia secondary to flogistic acalasia disease. We obtained a sufficient recanalization (dysphagia I grade) in the 85% of the cases with the neoplastic stenosis in the first 12 months and 60% of patients treated between 12 and 24 months.

Conclusions. E.L.S. could be considered the main treatment for patients with inoperable oesophageal cancer "no-responders" to open surgery. This treatment didn't influence the survival of patients but improve their quality of life.

KEYWORDS: endoscopic, laser surgery, oesophageal cancer, disphagia.

INTRODUCTION

We have treated cancers of the oesophagus, considered inoperable according to traditional literature standards, with a multidisciplinary approach for recanalization (X-rays guided endoscopic dilation, E.L.S. and, if necessary, positioning or an endoprosthesis). Such an approach allows us to dramatically reduce the massive dysphagia that usually affects these patients. Most of the observed cases were primitive oesophageal cancers usually involving the cardia with a grade III or IV dysphagia.

In our centre 120 patients, affected by pathologies considered non-responders to traditional surgery, were treated with E.L.S.

Primary and secondary neoplasm, arriving from non-specialistic centers with a superficial evaluation, an understanding pathology and, most of all, inadequate endoscopic/radiological documentation in 70% of the patients constituted 89% of cases. Almost all subjects had previously been treated for several months with anti-H2 and pro-kinetic drugs.

The remaining 11% were made of patients with benign pathologies or Barrett's oesophagus, which were considered inoperable because of their pathologies or their general status.

The incidence of oesophageal neoplasms in our casistic has been about 65% for primitive tumors and 10% for secondary cancers. Male/female ratio was 2.5/1.

Among the various risk factors we have been able to evidence: smoking, continuous alcohol intake (overl000cc/die) and Barrett's oesophagus (tab. 1A).

In evaluating operability, we considered several parameters concerning both the patients' status and the stage of the pathology (tab. 1B).

Surgical treatment was established for all those subjects which, according to international protocols, might gain advantages from traditional surgical treatment alone or combined with chemo or radio therapy (tab. 1C).

Risk Factors	%
Smoke	70
Alcohol	60
Barret's esophagus	2,5
Our experience	

Table 1A. Main Risk Factors.

Surgically non-responder patients underwent E.L.S., often associated to multidisciplinary treatment (dilatations/endoprosthesis). Mean survival of the patients treated with last approach ranged from 30 to 900 days, thus confirming that our technique does not influence long term survival in according to other authors (tab. 1D).

Our objective has been to minimize the amount of dysphagia in order to significantly improve these patients' quality of life.

Generale Status	Pulmonary Function	Hepatic Function	Renal Function	Cardiac Function	Diabetes	Tumors Stages
Sex	Vital Capacity	Serum albumin (g/dl)	Creatinine clearance (ml/min)	Electrocardiogram		
Age	Forced expiratory volume (FEV1)	Serum bilirubin (mg/l)		Chest radiograph		
Karnofsky index	Peak flow	Partial thromboplastin time (sec.)		Cardiologist's evaluation		
Alcohol abuse	PaO_2 (mmHg)	Amminopyrine breath test				
Tobacco abuse	$PaCO_2$ (mmHg)	Cirrhosis				
Weight loss						
Mental cooporation						

H. Bartels et al.: Br. J. Surg. 1998; 85: 840-844

Table 1B. Parameters used for preoperative functional assessment of patients with esophageal cancer.

	Value or finding
Pulmonary function	
Normal	VC > 90% and PaO2 > 70mmHg
Compromised	VC < 90% and PaO2 < 70mmHg
Severally impaired	VC < 90% and PaO2 < 70mmHg
Hepatic function	
Normal	ABT > 0,4
Compromised	ABT < 0,4; no cirrhosis
Severally impaired	Cirrhosis
Cardiac Function	
Normal	Normal risk
Compromised	Increased risk
Severally impaired	High risk
General Status	
Normal	Karnofsky index > 80% and good cooperation
Compromised	Karnofsky index < 80% and poor cooperation
Severally impaired	Karnofsky index < 80% and poor cooperation

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Table 1C. Classification of individual organ dysfunction based on multivariate analysis of the post-operative course after esophagectomy.

Risk group	No. of patients with one-stage surgery	No. of patients with two-stage surgery	No. of patients treated without operation
Low risk (n=111)	111 (1)	0	0
Moderate risk (n=125)	98 (1)	25 (1)	2
High risk (n=40)	2	16 (1)	22
Total	*211*	*41*	*24*

Values in parentheses, show patients who died after operation, giving a post operative 30-day mortality rate of 1,6%

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Table 1D. Prevalence of one stage surgery (resection and immediate reconstruction), two-stage surgery (resection and delayed reconstruction) and non operative therapy in patients with potentially resectable esophageal cancer in the various risk groups during phase 3 of the study, during which the composite risk score was included in the process of patients selection and choice of procedure.

MATERIAL AND METHODS

We examined about 135 patients affected by oesophageal pathologies and a degree III or IV dysphagia (tab. 1E)(tab 2).

The table n°3 shows the parameters, which have been considered while performing our clinical evaluation, which has been then completed by standard radiological diagnostics, endoscopic examination and US.

Among our patients, only 15 (primitive tumor or the cardia) were eligible for complete oesophagectomy

Grade	Dysphagia
I	Slight
II	Moderate
III	Serious
IV	Severe

Table 1E. Grades of dysphagia.

N° patients	IIIth grade	IVth grade
120	80	40

Table 2. Preoperative Dysphagia.

with or without limphadenectomy and immediate reconstruction. The remaining 120 (83 men and 37 women, age range 35-82yrs) were considered inoperable (tab. 5) and were thus included in our protocol. All patients were affected by severe (grade III or IV) dysphagia of various etiopathogenesis (tab. 6).

- Sex
- Age
- History of alcohol abuse
- History tobacco abuse
- Weight loss
- Dyspepsia
- Cardiovascular diseases
- Neurological disease
- Blood exams
- Tumor stage

Table 3. Used Parameters.

- IIIth stage of neoplasm (T3 N2 M0–1)
- Age over 75 years
- Cardiovascular diseases
- Coagulopaties
- Immunocompromised patients

Table 5. Conditions for inoperable patients.

Diagnosis	No. of patients
Achalasia	5
Flogistic strictures	5
Barrett's esophagus	3
Post surgical recurrences	7
Intra stent recurrences	10
Primitive neoplasms	78
Secondary neoplasm	12
Total	*120*

Table 6. Pathology.

It's worth noting all our patients (7) who had suffered post-surgical recurrence had previously undergone total oesophagectomy with the interposition of a bowl loop. In all cases, the recurrence had been discovered during programmed follow up endoscopic controls.

Patients with primitive neoplasms (78) presented a peculiar involvement or cardial tract or the oesophagus (tab. 7).

Diagnosis	No. of patients
Primitive neoplasm	78
Cervical esophagus	10 (12.8%)
Thoracic esophagus1	17 (21.7%)
Cardias	51 (66.5%)
Secondary neoplasm	12
Cervical (from laryngeal cancer)	7 (58.2%)
Cardias (from lung and mediastinic cancer)	5 (39.7%)

Table 7.

All the 120 inoperable patients underwent E.L.S. treatment associated, if necessary, with endoscopic dilatations (X rays guided) and/or positioning or self-expanding covered or non covered endoprostheses in a day-surgery setting.

Flexible fibre CO2 laser and single-use pinches were employed to perform this kind or treatment, which has been administered endoscopically with a continuous power now of 20-40 Watts in mixed technique, for a total dose or 800-4500 Joules. The procedure was cyclically repeated each 15-60 days.

After laser-surgery, it has often been necessary to position self-expanding prostheses (102 Wall Stents), in strict collaboration with our radiologists (MD). Ten percent of these endoprostheses were or the covered type since they were to be applied on intra-stent recurrences. Intra-stent laser administered radiotherapy, mean dose 39 Gy, after the positioning of the endoprosteses.

Mortality for this laser-surgery treatment was lower than 1% and also morbidity was reduced when compared to the other dates of other centers (tab. 8).

The cause of intraoperative death was cardiac arrest in a 78-year-old patient affected by cardiomegaly.

Iatrogenous perforation (9) healed spontaneously in 2 cases after administration of specific therapy (thoracic drainage, antibiotics and total parenteral nutrition), while in the remaining case it has been necessary to place a covered endoprosthesis.

Our protocol provided a 3-year follow-up with long-term survival ranging from 30 days to 30 months.

Complication	No. of patients	%
Re-strictures after radio therapy	2 (120)	1.66
Iatrogenous perforations oesophagus	3 (120)	2.5
Intraoperative exitus	1 (120)	0.83

Table 8. Complications.

RESULTS

The cases of inoperable oesophageal neoplasms we examined were treated according to a multidisciplinary therapeutic approach, shared by most of the other European centers.

All patients have been examined with standard radiological diagnostics, CT scan and endoscopy in order to perform a correct evaluation and perform traditional surgery, the only solving treatment, when possible.

Our E.L.S. treatment has obtained interesting results, especially in patients with severe dysphagia. In fact, all patients have experienced a reduction of this symptom after therapy. We experienced 100% of re-established canalization in benign pathologies, with total remittance or the dysphagia.

In primitive or secondary neoplastic conditions with grade III or IV dysphagia, we have observed a regression of such problem to grade I in 85% of cases during the first year from the treatment and in 60% during the second one. Among the few patients who have been followed-up for more than 24 months we observed a IInd degree dysphagia in 30% of our patients affected by oesophageal involvement in laryngeal, pulmonary and mediastinic cancers (tab. 9).

Grades of disphagia	% patients	Months
I	85	< 12
I	60	< 24
II	30	> 24

Table. 9 Post operative disphagia.

The 2 patients with self-expanding covered stents underwent radiotherapy after positioning of the device and experienced violent steno-cardiac pain and grade IV dysphagia recurrence just after surgery which led them to return for a precious endoscopic control. In both cases proximal dislocation or the covering sleeve of the endoprosthesis with subsequent complete stenosis of its middle part (see picture). On that behalf, our hypothesis would be to consider as possible causes:

- the radio-inducted degenerating effect induced on the covering of the prosthesis;

- the dislocating effect of the endoprosthesis on healing after-therapy retraction.

In both cases, removal of the stent had led to complete and sudden remittance of all symptoms.

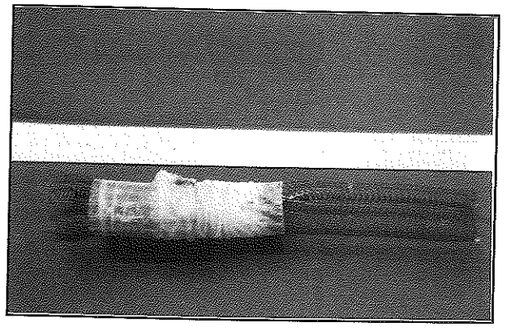
CONCLUSIONS

In conclusion, our initial purpose of reducing dysphagia to an acceptable level, thus improving our subject's lives, has been fulfilled in all patients.

We analyzed the cost effectiveness in the management of patients with esophageal cancer too (tab. 10).

The ELS is a new effective low-cost techniques to treat oesophageal's stenosis.

We therefore hope for a deeper collaboration between the specialists operating in this field finalized to the creation or a single, accepted protocol, for it truly may be the only way to achieve the same positive results despite the different geographic areas and techniques employed, thus giving our patients a better quality of life.



"Degeneration/displasement self expanding covered stent after radio therapy". Our Experience.

	Surgery	Radio Therapy	Laser	Endoprothesis	No treatment
Median Cost $	8.070	4.720	3.540	2.450	1.390
Range	2.540-39.780	3.364-6.867	2.530-6.340	1.647-5.550	1.132-2.348
Cost/month survival	457	364	342	-	-

M. A. Famdon, Br. J. Surg. 1998; 85: 1394-1398

Table. 10 Cost effectiveness in the management of patients with oesophageal cancer.

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