Complete objective response of oesophageal squamocellular carcinoma to biological treatment

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Submitted: 2008-11-19 Accepted: 2009-01-22 Published online: 2009-09-12

Key words: oesophageal carcinoma; remission induction; biological treatment; melatonin; somatostatin

Abstract

The synergetic use of Somatostatin, Melatonin, Retinoids, Vitamins C, D3, and E, Calcium, sulphated Aminoglucosides, and minimum doses of cyclophosphamide in a 70-year old male patient with inoperable scarcely differentiated oesophageal carcinoma, has provided, from the beginning of treatment in 1995 to the present date, an excellent quality of life, as well as a cure with functional recovery. This paper discusses the rationale and molecular action mechanisms of the treatment which has a differentiating, apoptotic anti-proliferation effect, preserving and enhancing, unlike chemo- and/or radiotherapy, both the trophic and functional capacity of organs and tissues, and immunity and antiblastic homeostasis. This result confirms the efficacy of this biological multiple treatment (MDB); it is also in line with the positive results already published on the use of MDB in low-grade NHL (66) and in stage 3 or 4 lung carcinomas (53). The MDB, with no need for hospitalisation, no toxicity and without in the least reducing working activity, gradually and slowly reduced, and then eliminated the tumour formation. According to the author, reporting this case is useful in order to call for greater interest in the possibilities offered to oncology by the MDB biological and receptor treatment.

INTRODUCTION

This case shows complete remission (CR) using biological treatment (MDB) of an oesophageal carcinoma monitored from 1995 to the present date. A list of components of the MDB biological treatment is included, as well as a synthesis of the documentation before and after the MDB treatment.

An extremely synthetic description of the MDB method is given, documenting its scientific basis, molecular biology action mechanisms, clinical response, and favourable toxicology profile.

Oesophageal carcinoma

The prognosis in patients with oesophageal cancer is unfavourable, with less than 5% surviving longer than 5 years (Harrison). The surgical excision of the whole macroscopically visible neoplastic tissue (total resection) is possible in only 45% of cases and is associated with a relevant percentage of complications and/or mortality.

Long-term survival is achieved only in patients with a tumour involving less than 5 cm of the oesophagus and no obstruction or extra-oesophageal diffusion (T1NoMo). Patients with oesophageal carcinoma seldom meet these criteria; most of them die within ten months of diagnosis. The radiation therapy combination (from 5500 to 6000
cGy) with mono or poly-chemotherapy may lead to a noticeable, though temporary, tumour mass reduction, with the downside of substantial toxicity. The randomised clinical studies performed so far, however, do not show the ability of chemo- and/or radiotherapy to significantly increase average survival expectancy.

**CLINICAL CASE**

**Oesophageal carcinoma** (classification: T4N2Mx)

Personal data of the patient: Year of birth: 1924, Sex: M

**ANAMNESES** — The patient, M.D., aged about 70, started to suffer from dysphagia about three months ago, accompanied by a burning sensation in the retrosternum region, as well as medium-level pain irradiating throughout the abdominal area, for several minutes and several times during the day. Food reflexes and weight loss (6 kg/3 months), as well as changes in bowel movements — with a tendency to constipation over the last month — were also reported.

**REMOTE ANAMNESES** — Pleurisy at the age of 10; fracture of the cranial base, right clavicle and right ear drum perforation following a motorcycle accident at the age of 21. Bi-lateral bronchopneumonia at the age of 30, exophthalmus in the left eye caused by hyperthyroidism at 31. Since the age of 50 the patient has been suffering from high blood pressure (180/110 mm/Hg) treated pharmacologically at home.

**INITIAL ROUTINE TESTS:**

March 2, 1995 — CT ANGIO chest-abdomen scan shows... “wall thickening on the third thoracic oesophageal distal” and on the gastric-oesophageal joint with diverticuli. Lymph nodes measuring 1 cm in the peri-cardiac region and in the left gastric area.” Patient admitted to the III Clinica Chirurgica, Pol. “Umberto I”, Rome. March 3, 1995 — EGDS performed “... at a 36-cm distance from the top teeth there is a diverticulus with a large neck (biopsy performed) containing food residues...” March 28, 1995 — histology exam: Scarce differentiated carcinoma superficially ulcerated. April 4, 1995 — CT scan (Fig. 1, Fig. 2)

April 19, 1995 — The patient underwent an “exploratory laparotomy” with a view to placing a Port-a-cath which would allow for a continuing perfusion of chemotherapy drugs and also in order to assess the possibility of an endoprostheses.

The outcome of the operation was palliative and the impossible surgical exeresis of the tumour was ascertained. Report on the exploratory laparotomy:... “...oluminous oesophageal neoplasm... which also affects the peri-oesophageal tissue and the diaphragm and spreads dropping to the retroperitoneum, to the stomach and pancreas which closely adheres to it. In the mediastinum it is possible to touch and see coarse discharges presumably neoplastic. Many regional and extraregional lymph nodes have increased in volume.” Considering the seriousness of the local, chest-abdominal spread of the disease, the patient’s age and general conditions, the decision is taken not to intervene any further.”

The patient underwent chemotherapy treatment, with a reduction of the assessable mass by about 50% (8 courses of 5 FU + mitomycin – 28 radiotherapy courses).

On October 28, 1995 — the treatment was suspended because of bleeding and melaena; it was not considered possible to repeat the chemotherapy treatments and the patient was discharged with the sole advice of anti-pain and support treatment. Cancer progression.

December 1995: cancer progression and start of MDB.

April 4, 1996 — The patient was admitted because of right basal bronchopneumonia to the “Forlanini” hospital in Rome. Diagnosis of degenerative cardiopathy with minor mitral insufficiency. May 2, 1996 — The patient was discharged after the necessary treatment. April 3, 1997 — The CT scan showed an “overall reduction of the thickening on the 3rd oesophageal distal tissue:...” the CT scan of the chest and abdomen performed before and after iv iodine contrast medium perfusion, with the volumetric acquisition technique, showed an overall reduction of the irregular thickening of the 3rd distal peri-oesophageal tissue, in the supra- and under-cardial region, involving the gastric fundus. The affected area shows a clear enhancement with the iodine contrast medium perfusion...” (Fig. 3, Fig. 4)

October 29, 1997 — Hospital admission because of DYSPHAGIA. EGDS + biopsy performed, to assess the possible placing of the prosthesis. REPORT: Negative endoscopic exploration of the proximal oesophagus. On
a supra-cardial level extending below the cardia in the fundus region, an infiltration process is reported with a substantial reduction of the oesophageal lumen and necrotic lesions. Hard consistency of the biopsy sample. The histology exam of the biopsy in the thickened and suspicious supra-cardial area excluded the presence of neoplastic cells. HISTOLOGY: Gastric mucosa with intense acute and chronic inflammation and from fundus ulceration detritus.

July 20, 1998 – Total Body CT scan performed. CHEST CT SCAN: Exam performed after administering the contrast medium. No clear tomodensitometric alterations of a focal type at the level of the lung parenchyma. Evidence of disventilatory areas in the basal left region; no evidence of clinically relevant lymphadenopathy in the main mediastinum lymph node sites. No pleural effusion. ABDOMEN CT SCAN: The scans performed with volumetric acquisition starting from the third oesophageal distal tissue highlight a thickening of the oesophageal tract examined, with a marked enhancement of the walls, no evidence of the lumen, contact with the wall of the ascending aorta; no evident significant loco-regional lymphadenopathies. (Fig. 5, Fig. 6).

January 28, 1999 – Total Body CT scan. REPORT: CT CHEST – ABDOMEN AND PELVIS: No signs of tomodensitometric focus lesions. The ventricular system is in axis, not dilated. Parenchyma thickening with slightly blurred margins in the paracardiac rear right locus.

Thickening and lack of homogeneity of the thoracic and trans-diaphragm oesophagus with a strongly blurred and irregular appearance and subsequent reduction of the gut lumen. Increase in density of the perivisceral fat in the tract below the diaphragm. There is evidence of some adenopathies whose Ø is within normal limits in the pre- and retro-carenal azygotic locus.

The study of the liver shows no evidence of tomodensitometric focus lesions in progress. Nothing to report as regards the gallbladder. No significant alterations of the pancreas, in adipose involution. No alterations of the spleen. (Fig. 7, Fig. 8).

October 1, 2000 – Hospital admission because of MELAENA episodes. Diagnosis: acute haemorrhage and post-haemorrhage acute anaemia. EGDS performed – REPORT: Easy introduction of the endoscopic
tool. Negative exploration of the proximal oesophagus. At the level of the 3rd distal there is narrowing and hypoelasticity of the oesophageal wall across the whole circumference with no clear infiltration: it is difficult to proceed and, in the cardial locus on the front wall, a large necrotic lesion of about 2 cm is evident, as already described several times. At the edge of this lesion, only in one point, is a hyperemic mucous area with probable signs of recent bleeding. The gastric cavity is explored, with no evident lesions. Hyperaemia of the duodenal mucosa with discernible contact frailty. There are no signs of bleeding in progress in any part of the explored tract.

PATHTHODLOGICAL HAEMATO-CHEMICAL VALUES

RBC 2260000-2900000; Hb 6.6gr% – 9gr%; Hti 20–28%; ESR 50; blood sugar 146; Albuminaemia: 2.95 gr/dl.

The patient underwent blood transfusions (6 units), suspension of oral feeding, treatment with ranitidine iv (before) and with omeprazole po (after a few days).

October 9, 2000 – The patient was discharged.

November 15, 2001 – Hospital admission following an epilepsy fit during the night.

Brain CT scan performed which “... reveals the presence of a small hypo-density area located at the level of the white substance adjacent to the left ventricular crossway, presumably related to outcomes of a lesion on an ischaemic cerebrovascular basis. A small hypo-density area is observed, spreading at the level of the periventricular substance, possibly indicating tissue suffering on a chronic ischaemic cerebrovascular basis. No evidence of haemorrhage injuries.”

November 21, 2001 – The patient was discharged.

October 28, 2004 – Total Body CT scan performed. CHEST: no evidence of nodules and/or lung consolidation areas of a suspicious kind. Pleural left fissure thickening in the basal region with of the left half-diaphragm. No pleural effusion. Fixity with wall concentric thickening of the third distal section of the chest oesophagus and of the oesophageal-gastric joint, essentially unchanged with respect to the previous visual control. No evidence of hilus-mediastinum lymph node tumefaction under the diaphragm. Liver normal in size and
shape, without focal lesions. Biliary tract not dilated. Gallbladder normally distended with normally thick walls. No evident alterations of the spleen, pancreas, adrenal glands or in the right kidney. (Fig. 9, Fig. 10)

**January 17, 2007** – CT Total Body scan performed.

CHEST: No evidence of focal alteration of the lung parenchyma. No hilum-mediastinum lymphadenopathies or pleural effusion.

ABDOMEN AND PELVIS: Liver size within the limits; parenchyma density with no focal alterations. Biliary tract not dilated; distended gallbladder, with no stones. Portal vein regular in size and patent.

Adrenal glands with regular size and shape. Spleen within the normal limits. Pancreas difficult to define.

Kidneys in locus, reduced cortex-medullary ratio; left kidney cysts, no calicopyelic ectasis.

No evidence of interaorta-caval and lomboaortic lymphadenopathies. Bladder symmetrically distended with homogeneously thickened walls (effort bladder?). Hypertrophic prostate not homogeneous in density and with small parenchyma calcifications. No ilium-obturator lymphadenopathies.

**February 1, 2008** – TB complete abdomen CT scan (with/without cm), TB cranial CT scan (with/without cm), TB chest CT scan (with/without cm).

Scan performed before and after contrast medium iv injection, using the volumetric multilayer technique.
Therapy and clinical course

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and in addition, for apoptotic reasons, minimum doses

genic, antimetastatic action to strengthen immunity

with a differentiating, cytostatic, apoptotic, antiangio-

Method, which involves the synergetic use of molecules

possible, the patient asked to be treated with the Di Bella

ment because of its toxicity and no surgical exeresis was

local progression then started again and, since it was not

pancreas, regional and extra-regional lymph nodes. The

adeal neoplasm and peri-oesophageal extension, as

Chemoradiotherapy obtained an objective response,

RESULTS

Therapy and clinical course

The chemoradiotherapy obtained an objective response,

No alterations of the cerebral parenchyma, with focal

characteristics.

Ventricular system in axis with respect to the median

line. The cerebral convexity sulci are within the limits.

No visible pulmonary parenchyma thickenings or effu-
sions inside the pleura. Basal parenchyma dystelectasias.

Centrimetric mediastinum lymph nodes. Enlargement

of the ascending aorta (42 mm). Mediastinum organs with regular morphology. No endo-abdominal

effusions.

Normal liver in terms of size and structure. No ecta-
sia of the biliary tract inside or outside the liver. Regular

portal calibre. No spleen alterations. Normal pancreas in
terms of size and structure. Bilateral thinning of the renal

parenchyma. Normal elimination through the kidneys of

the iodate contrast medium. No pathological lymph

nodes with respect to size in the sub-diaphragm loci.

Volumetric increase of the prostate. (Figs. 11–13).

The patient is still alive and in good condition, eating

without difficulty. The initial treatment has been

reduced and the patient is following this pharmacologi-
cal regime:

Octreotide Lar 20 mg – 1 intramuscular injection
every 28 days
Retinoid solutions: – 1 spoon in the morning on an
empty stomach with
Dihydrotachysterol (vit.D3) – 9 drops with the
retinoids
Melatonin conjugate 2mg – 3 tablets after meals, (9
per day)
Bromocriptine 2.5 mg – ¼ of a tablet after meals × 3
times a day; as well as:
Phenobarbital – ½ tablet (epilepsy fit)
Enalapril 20mg – 1 tablet (hypertension)
Lansoprazole 30 mg – 1 tablet
Metoclopramide 10mg – 1 tablet
Nitroglycerin T5 – 1 patch
Levotiroxine 100 mg – 1 tablet

1) Somatostatin (14 amino acids) (SST), injected
under the skin at night over the space of 10 hours
with a programmable infusion pump, due to SST
short half-life (about 3 minutes) to coincide with
the nighttime peak of inrection of GH.

2) Octreotide, similar to somatostatin (eight amino
acids) and lag time formulation, 30 mg intra-mus-
cular every 25 days, for complete receptor and tem-
poral saturation, with the same anti-proliferative
and pro-apoptotic objective as the somatostatin.

3) Bromocriptine 2.5 mg ½ tablet morning and
evening to inhibit prolactin, a powerful and ubiq-

uous mitogenic hormone.

4) Cabergoline 1/2 tablet twice a week, to reinforce the
bromocriptine effects; cabergoline also has a mark-
edly longer half-life.

5) Vitamin solution, according to Prof. Di Bella’s for-
mula:

Beta carotene 2 g
Palmitate axerophthol 0.5 g
All-trans retinoic acid 0.5 g
Alpha-tocopherol 1000 g
One medium spoonful (100 mg × Kg of body
weight), at least 15 minutes before eating, 3 times
a day

6) Dihydrotachysterol (vitamin D3 synthesis): 10
drops in the same spoon along with the vitamin
compounds (i.e. 30 drops per day)

7) Chemically complexed Melatonin with adenosine (by
means of a hydrogen link) and glycine (according
to Prof. Di Bella’s formula: 12% melatonin, 51%
adenosine, and 37% glycine) 2 mg tablet, 10 per day

8) Calcium 1 g, 2 times a day with the ascorbic acid

9) Ascorbic Acid 2 g, along with the calcium in a glass
of water, 2 times a day with meals

10) Glucosamine sulfate + Chondroitin sulfate 1500 mg,
3 times a day

11) Cyclophosphamide tablets 50 mg, one tablet twice
a day;
Rationale of the Therapy

whose criteria, aims and mechanisms are totally different from the usual cytolytic treatment (the method has thus proved its ability to replace surgery, radiotherapy and chemotherapy, which are known to be unable to eradicate solid tumours). In this case the neoplasm was widely spread outside the oesophagus, with voluminous adenopathies disseminated in the mediastinum and abdominal region; it also extended to the peri-oesophageal, as well as to diaphragm, retro-peritoneum, stomach and pancreas area; a surgical solution was thus excluded. The objective response to the MDB extended to the complete healing of the oesophageal lesion and of its branches.

Rationale of the Therapy

In pretumoural and tumoural stages of the epithelial cells in general and of the airways-digestive tract in particular (Griffin et al. 1987), liposoluble epithelioprotective vitamins play an important therapeutic role (Dong et al. 2008, Launoy et al. 1998). This effect is decisively increased by the MDB formulation and doses, in which the antioxidant effect of vitamin E preserves the retinoids from oxidative degradation, prolonging their half-life and efficacy. Dispersion of the solution to its molecular state increases its bioavailability. The high surface tension forms a stable and adherent protective layer on the epithelial surface. Betacarotene, Palmitate axerophthol, All-trans retinoic acid, Alpha-tocopherol-acetate and Dihydrotachysterol intervene on the trophism, functionality and regulation of cell growth in general and on epithelial cells most of all. Their effect, as in the case presented here, is enhanced by the direct contact with the mucosa during transit through the digestive tract.

The loss of differentiation and proliferation, even if to different extents, are common denominators of all neoplasms. The ubiquitous receptor expression of prolactin (Ben-Jonathan et al. 2002; Hooghe et al. 1998) and GH (De Souza et al. 1974, Lincoln et al. 1998) are one of the confirmations of the direct and generalized mitoarangistic role of this molecule.

Cellular proliferation is highly dependent on prolactin and GH, both being powerful growth factors, and on GH-dependent mitogenic molecules which are positively regulated by it, such as EGF, FGF, HGF, IGF1-2, NGF, PDGF, VEGF, and TGF, in addition to growth factors produced by the gastrointestinal tract such as VIP, CCK, and G. Both physiological as well as neoplastic cellular proliferation take place by means of these same molecules, which the neoplastic cells use to an exponential extent compared to healthy ones. Biological antides of GH, such as somatostatin and similar compounds, reduce not only the expression and transcription of highly mitogenic growth factors, such as IGF1-2 (Cascinu et al. 2001; Kath & Höfken 2000; Schally et al. 2001), EGF (Szepéházi et al. 1999), VEGF (Mentlein et al. 2001), but extend their negative regulation to the respective receptors with evident anti-proliferative and anti-angiogenic effects (Albini et al. 1999; Barnett 2003; Barrie et al. 1993; Gruszka et al. 2001; Jia et al. 2003).

The extent of the GH-IGF1 axis influence on neoplastic biological development is worth noting. The IGFRs respond mitogenetically to IGF. The suppressive effect of SST and its analogues on the serum levels of IGF1 is both direct, by inhibiting the IGF1 gene, as well as indirect by suppressing GH and thus its hepatic induction of IGF1. Angiogenesis is essential to neoplastic progression. Angiogenesis is in turn regulated by the fall of monocytes, interleukin 8, and by such growth factors as VEGF, TGF, IGF1, FGF, HGF, and PDGF. Each of these factors is negatively regulated by somatostatin and its analogues (Albini et al. 1999; Barrie et al. 1993; Cascinu et al. 2001; Florio et al. 2003; Held-Feindt et al. 1999; Jia et al. 2003; Turner et al. 2000; Vidal et al. 2000; Watson et al. 2001; Wiedermann 1993).

The inhibition of angiogenesis induced by SST is synergistically enhanced by:

- MLT (Di Bella & Gualano 2006; Di Bella et al. 1979; Lissoni et al. 2001),
- retinoids (Kini et al. 2001; Lubin et al. 2008; Majewski et al. 1994; McMillan et al. 1990; Muller et al. 1997; Roth et al. 1999),
- vitamin D3 (Kisker et al. 2003; Mantell et al. 2000; Meggouh et al. 1990),
- vitamin C (Ashino et al. 2003),
- prolactin inhibitors (Turner et al. 2000), and components of the extra-cellular matrix (Liu et al. 1998; Özerdem et al. 2004; Wang et al. 1996).

Likewise, the cytostatic, anti-proliferative, and antimetastatic effect of somatostatin is effectively synergized by MDB’s other components:

- Retinoids (Hashimoto et al. 2003; Khuri et al. 2001; Lotan 1997; Onogi et al. 1998; Piedrafita & Pfahl 1997; Shimizu et al. 2004; Wang et al. 1999)
- MLT (Jatoi & Thomas 2002; Kvetnoy & Levin 1986; Maestroni et al. 1996)
- Vitamin D3 (Barroga et al. 2000; Giovannucci et al. 2006; Jensen et al. 2001)
- Cabergoline and Bromocriptine (prolactin inhibitors) (Ben-Jonathan et al. 2002; Gruszka et al. 2001)
Vitamin E (Malafa et al. 2002; Neuzil et al. 2002; Odeleye et al. 1992; Turley et al. 1995)
Vitamin C (Cameron et al. 1979; Head 1998, Murata et al. 1982)

The causal relationship between GH's receptor expression and tumor induction and progression has been shown (Lincoln et al. 1998), histochemically demonstrating markedly higher concentrations of GHR in tumor tissues compared to physiological tissues, thus showing the powerful mitogenic role of GH with proliferative indices depending on dose. This is direct, via receptors, as well as indirect, by inducing the GH-dependent hepatic expression of IGF1. The GH-IGF1 axis has a decisive role in the biological behavior of many neoplasms. In a very high percentage of neoplastic cells, IGF1 receptors have been identified which respond mitogenically to the Ligand. Somatostatin exerts an antiproliferative action directly, while inhibiting the IGF1 gene's expression, as well as indirectly, by suppressing GH, which IGF1's incretion depends on (Schally et al. 2001).

Somatostatin's inhibiting activity on EGFR, another powerful mitogenic growth factor, with multiple mechanisms, has also been thoroughly documented:

- depending on the dosage, inhibition of tyrosine phosphorylation induced by activation of EGFR by EGF (Mishima et al. 1999);
- reduction of EGFR in tumor cells (Szepesházi et al. 1999);
- reduction of EGF's expression (Israel et al. 2000);
- reduction of EGF's plasma concentration (Cascinu et al. 2001).

Mitogens produced by the gastrointestinal tract such as VIP, CCK, and G are strongly inhibited by somatostatin and/or octreotide (Kath & Höffken 2000).

The efficacy of somatostatin and/or octreotide (Jin et al. 2008) is enhanced by a factorial synergic mechanism with MDB's other components (Kapil et al. 1993). The literature thus confirms the differentiating anti-neoplastic, anti-proliferative, anti-angiogenic, and anti-metastatic action mechanisms of all MDB components. In the case described here the haematochemical tests did not show any damage, but rather a progressive reduction of prolactin, IGF1, and maintenance of low levels of GH.

The objective result, in the absence of toxicity, through the slow and gradual reduction – achieving complete disappearance – of the extensive initial neoplastic lesions and of the adenopathies, associated with the blocking of any loco-regional progression or dissemination of the metastasis, highlights the effectiveness of this multiple therapy and is in line with the results already published about the use of this method (Todisco et al. 2001) in low-grade LNH and lung carcinoma stages 3 and 4 (Norsa et al. 2007). The MDB method requires no hospitalisation or even day-hospital admission and is not toxic. The treatment resulted in the recovery of oesophageal function, trophism and functionality of organs and tissues; after thirteen years, this allowed a physiological and active quality of life until the age of 84.

It is reasonable to conclude, therefore, that the early application of this method as the front-line treatment, in a body not debilitated by the toxic, mutagenic and immunodepressive effects of chemo-radiotherapies, could achieve markedly more rapid results. It is useful to report this case in order to encourage greater interest, study and in-depth analysis of the possibilities offered to oncology by the immunoneuroendocrine, biological and receptorial MDB therapy.

REFERENCES


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