

DIPLOPIA AND THE CANCER PATIENT

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Abstract

Twenty patients with known systemic cancer and diplopia are discussed. These cases divide evenly between lateral rectus palsy and vertical deviations; the latter presenting diagnostic difficulties. Prism therapy was used. No correlation was found between ocular muscle defect and the type of cancer treatment.

Key Words

Cancer, ocular muscle palsy, prism therapy, radiotherapy, chemotherapy.

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INTRODUCTION

In the past few years we have noted with increasing frequency patients with systemic cancer presenting with diplopia. We were interested in correlating this occurrence with the status of their cancer, the type of therapy received or any particular etiologic factor.

MATERIALS

We reviewed the charts of 20 patients with known cancer who presented with diplopia. Eliminated from the study were patients with primary brain or orbital tumors. Only two patients had other unrelated systemic diseases. These were hypertension and hypothyroidism.

A. CANCER

In nine patients the primary lesion was breast carcinoma. Cancer of the breast is the most common malignant tumor in women in the United States causing about 20% of all cancer deaths in

females.¹ Seven patients had the primary lesion in the head and neck region. Nasopharyngeal carcinoma dominated this group, although tumors of the nasopharynx comprise less than 1% of all cancers in the United States. The average age of occurrence is about 50 years. It is found twice as often in males as in females. Cranial nerve involvement occurs in 38% of these cases.¹ The remaining patients in the head and neck group had cancer of the tongue, gum or larynx. Three patients had cancer of the prostate and one 18 year old male, the youngest of the group, had diffuse histiocytic lymphoma. The ages of the patients when first seen by us for diplopia ranged from 18 to 79 years. They were evenly divided between male and female. There are 10 known deaths.

B. STRABISMUS

1. Esotropia

Ten patients presented with esotropia. Lateral rectus palsy accounted for the esotropia in all but one of the patients. Five patients with esotropia had breast carcinoma. One, age 79, demonstrated a concomitant, intermittent, divergence insufficiency type of esotropia. By history it had been present but asymptomatic for 10 years. Within the last year it had become worse and for the first time she sought medical advice about it. The

strabismus was felt to be unrelated to the breast carcinoma which had been surgically treated 4 years earlier with no evidence of metastases. A long history of hypertension was questioned as a contributing factor to her strabismic problem. The other 4 patients with breast carcinoma had a lateral rectus palsy. There was no follow up for one patient. The other 3 had bone metastases and two had multiple site metastases. None had clear evidence of brain involvement. All three died within 2 years of the onset of diplopia.

Diplopia was the presenting sign of the cancer in two patients who were diagnosed as carcinoma of the nasopharynx. In one patient the diplopia persisted after effective radiation therapy to the tumor. The second patient was found to have involvement of cranial nerves V through XII. Following radiation he showed evidence of complete regression of the primary tumor with considerable improvement of the multiple cranial nerve palsies. Diplopia persisted. Nine months later the other lateral rectus became involved and there was evidence of recurrent cancer. Brain metastases were found. Death occurred 5 months later. There was no follow up for the patient with tongue cancer. The two patients with prostate carcinoma showed no evidence of metastatic disease. The lateral rectus palsy recovered in one patient while the outcome of the second was unknown.

Esotropia treatment

We successfully treated the diplopia with prisms in 8 patients. One patient did not require a prism. Instead, a head position was adopted for the mild paresis and the patient was comfortable. The lateral rectus palsy recovered in 5 patients. However, one of these patients with metastatic breast carcinoma had a recurrence of the diplopia two years later. She again presented with a lateral rectus palsy of the same eye. One patient came to strabismus surgery without follow-up observation.

2. *Hypertropia*

Ten patients presented with vertical deviations. Four had breast carcinoma. One of these had a definite diagnosis of a bilateral IVth nerve involvement. The classical picture of right hypertropia in the left field of gaze with left hypertropia in the right field of gaze along with a mild V pattern was easily demonstrated. This patient whose primary lesion was breast carcinoma had diffuse brain and bone metastases. She died 1 month after the onset of diplopia. The other 3 patients with breast

carcinoma all had bone metastases. Two showed brain involvement. A left hypertropia was present in these 3 patients. The test results varied making a definitive diagnosis difficult. An example of this diagnostic dilemma is illustrated in the following case. A 49 year old woman, while under chemotherapy for metastatic breast carcinoma, presented with diplopia for a duration of 3 days (Fig 1). She showed a mild left ptosis and a left hyperdeviation in the primary position, increasing to the right field and down. A left superior oblique was suspected; however, neither the head tilt test nor the Lees screen confirmed this diagnosis. In fact, the Lees screen indicated the involvement was with the right eye (Fig 2). The other patients demonstrated similar diagnostic problems.

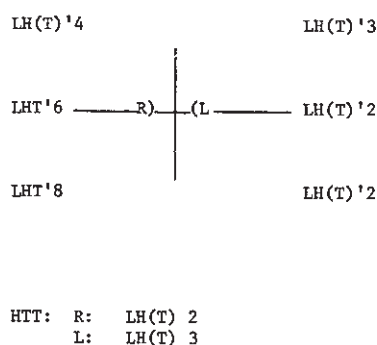


FIGURE 1

Four of the 10 patients belonged to the head and neck group. All of them again displayed vertical patterns that gave us difficulty in making a definitive diagnosis while employing the usual tests.

Of particular interest were the two patients with nasopharyngeal carcinoma (Fig 3). They both showed a vertical deviation of opposite type in the upper field compared with the lower field of gaze with no restriction of movement. The diagnosis of a partial IIIrd nerve palsy was suggested but not confirmed. Evidence of metastases was not available in one patient. The other had local extension of the tumor but no evidence of brain metastases.

The patient with prostate cancer had a one week history of diplopia from a right hyperdeviation in primary position. A definitive diagnosis was not made and the strabismus resolved within six weeks. No metastases was evident.

The patient with lymphoma, the youngest in our group, developed diplopia from a left hypertropia. Characteristics of a left superior oblique palsy were present but this diagnosis was withheld

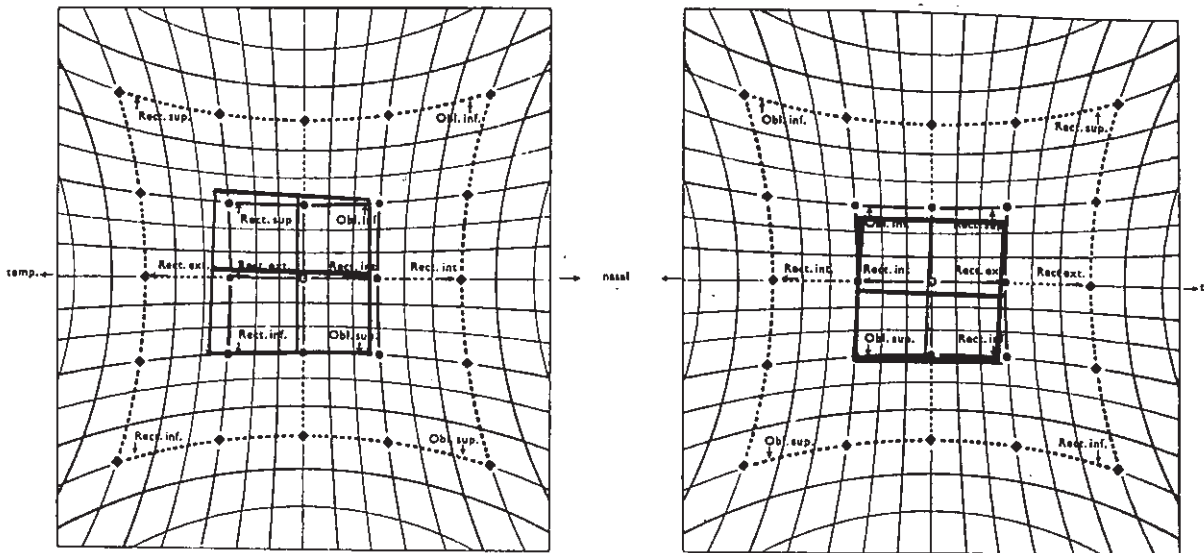


FIGURE 2

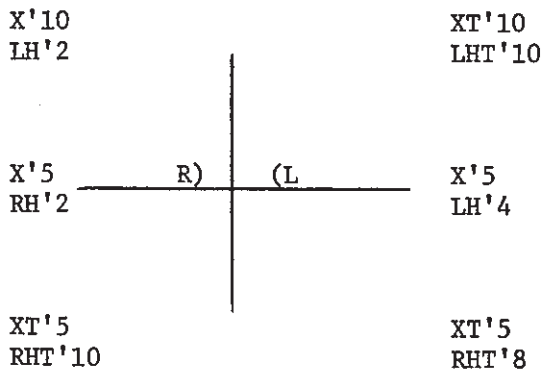


FIGURE 3

because all test results were not supportive. Brain metastases was found and the patient died 3 months after the onset of diplopia.

Considering the difficulty in diagnosing a definite vertical muscle involvement in these cases, we suspect that some of them might well be skew deviations.

Hypertropia treatment

Prism therapy for vertical diplopia was undertaken with 5 patients, two were comfortable while the other 3 patients complained of torsion. Four patients did not receive prisms either due to the seriousness of their condition or because they were not bothered by the diplopia. One patient came to strabismus surgery twice without success.

C. CANCER THERAPY
1. Chemotherapy

Chemotherapy is one of the well recognized non-metastatic causes of neurological dysfunction in patients with systemic cancer.^{2, 3, 4, 5, 6} Of the chemotherapeutic agents, there are a few that are especially well known to cause such disorders (Fig 4). These include the vinca alkaloids, the nitrogen mustards and methotrexate. The effect can vary from peripheral neuropathy to cerebellar ataxia to depression. Diplopia is not listed as one of the manifestations except isolated instances with procarbazine.⁴ One patient in our series was treated with this drug.

Eleven patients were treated with some form of chemotherapy during the course of their disease. The time sequence of the diplopia in relation to the chemotherapy varied. Onset of diplopia occurred in some patients before chemotherapy was begun, while others after it was completed. In 2 patients diplopia resolved during the treatment.

2. Radiotherapy

Radiotherapy is one of the principle forms of treatment in cancer patients. Nasopharyngeal carcinoma is usually not surgically attacked particularly after symptomatic cranial nerve involvement is present. Therefore radiation is the therapy of choice in these patients. A complication of radiation to this area is lenticular opacities which

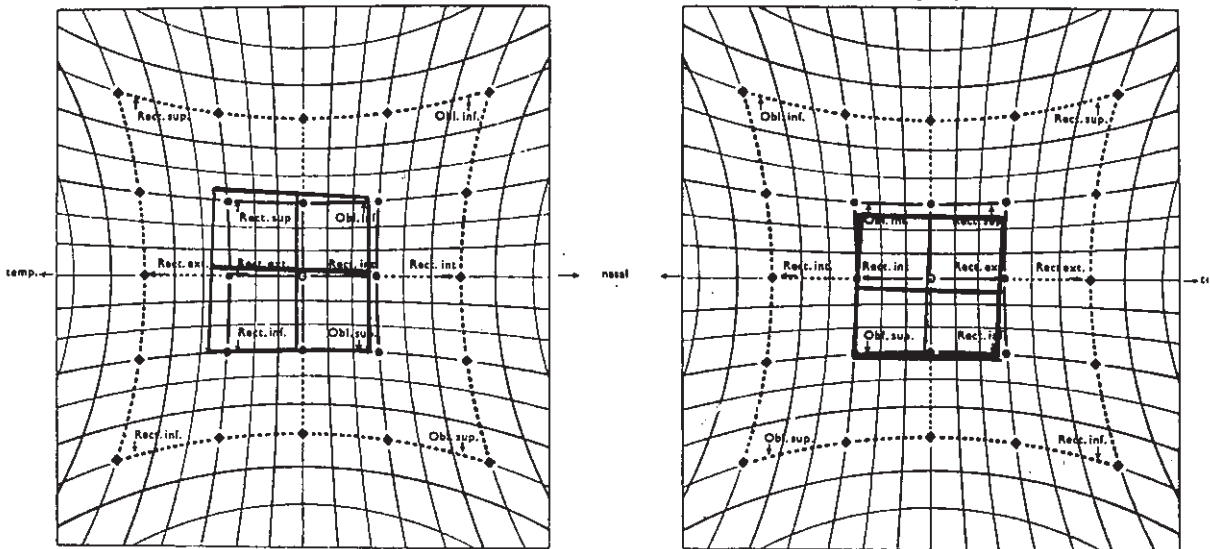
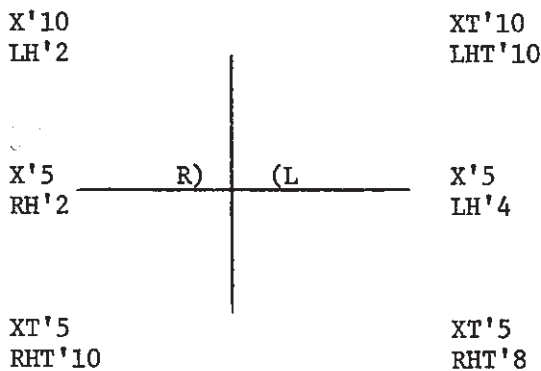


FIGURE 2



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CHEMOTHERAPEUTIC AGENTS CAUSING
NEUROLOGIC DYSFUNCTION

- VINCA ALKALOIDS
 - Vincristine sulfate
 - Vinblastine sulfate
- L-ASPARAGINASE
- NITROGEN MUSTARDS
- METHOTREXATE
- 5-FLUOROURACIL
- PROCARBAZINE HYDROCHLORIDE
- CYTOSINE ARABINOSIDE
- MITOMYCIN

FIGURE 4

are often stationary and subclinical¹ although to some degree preventable by shielding. Various forms of neurological dysfunction following radiotherapy have been reported⁵ including delayed radionecrosis of the optic chiasm.⁷

Twelve patients were treated with radiation. No correlation was found between onset of diplopia and the course of radiotherapy. It would appear from this that the onset of diplopia is probably unrelated to either chemotherapy or to radiation.

SUMMARY

In summary, twenty patients with known systemic cancer and diplopia were evaluated. Dominating this group was breast carcinoma followed by nasopharyngeal carcinoma.

One-half of the patients presented with esotropia which was easily diagnosed as a lateral rectus palsy. The remaining patients presented with hypertropias the cause of which could not be easily determined. Every effort was made to relieve the diplopia with prism therapy. Patients with esotropia responded more favourable than did patients with vertical deviations.

From this study we have tried to relate the diplopia found in patients with known systemic cancer to their disease or its treatment. We were unable to find a relationship between the strabismus and the cancer treatment. In patients with end-stage cancer, the strabismus often appeared related to the disease process.

TABLE I
20 CANCER PATIENTS PRESENTING WITH DIPLOPIA

		AGE SEEN	STRABISMUS	PRIMARY CANCER SITE	METASTASES
1.	DLeS	77	RLR	TONGUE-GUM	NONE
2.	IS	67	LLR - recovered	NASOPHARYNX	NONE
3.*	MC	61	RLR - bilateral	NASOPHARYNX	CRANIAL NERVE V TO XII, LOCAL BONE INVASION, BRAIN
4.*	ES	54	RLR - recovered recurred	BREAST	LOCAL BONE INVASION
5.	MD	62	LLR	BREAST	UNKNOWN
6.*	LD	30	LLR - recovered	BREAST	BONE, PAROTID, OVARIES AND FALLOPIAN TUBES, LUNG
7.*	AS	48	LLR - recovered	BREAST	BONE, SPINAL CORD, LUNG, PALATE AND PHARYNX
8.	HB	79	DI	BREAST	NONE
9.	RG	61	LLR	PROSTATE	UNKNOWN
10.	MK	73	LLR - recovered	PROSTATE	NONE
11.*	RA	61	RHT	NASOPHARYNX	UNKNOWN
12.*	MM	51	LHT - recovered recurred	NASOPHARYNX	LOCAL INVASION LIVER
13.*	BO	63	RHT	LARYNX	UNKNOWN
14.	MB	67	LHT	TONGUE	UNKNOWN
15.	MS	70	LHT	BREAST	LOCAL BONE INVASION
16.*	WW	52	LHT	BREAST	LOCAL BONE INVASION BRAIN
17.	FB	49	LHT	BREAST	BONE BRAIN
18.*	RO	49	BILATERAL IV	BREAST	BONE BRAIN
19.	BW	65	RHT - recovered	PROSTATE	NONE
20.*	WD	18	LHT	LYMPHOMA	BONE LIVER BRAIN

* DECEASED

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