Acquired Divergent Strabismus: Presumed Metastatic Gastric Carcinoma to the Medial Rectus Muscle

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ABSTRACT
A patient with rapidly progressive metastatic gastric carcinoma developed diplopia and diminished adduction of the right eye. The right medial rectus muscle belly was enlarged, as shown by computed tomography. This case is unusual, because gastric carcinoma comprises only 1% of orbital metastases and less than 5% of all orbital metastases localize to extraocular muscle.

INTRODUCTION
It is rare for gastric carcinoma to metastasize to the orbit. Henderson reviewed 522 orbital tumors and found 56 (7%) to be metastatic; only two were from a stomach primary. Of 227 tumor registry ocular and orbital metastases reported by Perry and Font, three were from a gastric primary but none were localized to the orbit. Freedman and Folk found only one of 112 clinical cases of ocular and orbital metastases was from the stomach. Bloch and Gartner found metastasis in 12% of eyes of 230 patients with autopsy-proven carcinoma. Of the 11 stomach primaries, none metastasized to the eye. Stomach was the primary source of one of 100 clinicopathologic ocular and orbital metastases published by Hutchinson and Smith. Gastric carcinoma most commonly spreads to liver (40%), lung (20%), peritoneum (17%), bone (10%), adrenal glands (8%), and rarely to the central nervous system (2%). The extraocular muscles are the locus of from 0% to 4% of ocular metastasis. Combining these series, seven of 523 (1%) ocular and orbital metastases were from a gastric primary.

CASE REPORT
A 59-year-old woman underwent a palliative resection of a grade 3-3 gastric adenocarcinoma. A needle biopsy of one of several lung nodules confirmed metastatic disease. One month after surgery, she presented with multiple subcutaneous nodules, headache, and horizontal diplopia, especially in left gaze. Visual acuity, pupils, confrontation fields, lid function, ocular media, and fundi were normal. There was no exophthalmos. Ocular motility was normal except for decreased adduction (graded -1 of 4) and decreased saccadic velocity of the right eye. There was no abduction nystagmus of the left eye. Lancaster red-green testing revealed 4 prism diopters (pd) exophoria in primary gaze and orthophoria in right gaze. With the right eye fixing there was a 12 pd exophoria in left gaze and with the left eye fixing there was a 6 pd exophoria in left gaze (Figure 1). The deviation did not fatigue with time. Forced ductions were not performed. Thyrroxine, thyroid stimulating hormone, thyroglobulin antibodies, mesothelial antibodies, platelet count, prothrombin time, and activated partial thromboplastin time were normal. Two cerebrospinal fluid samples showed increased protein (141 mg/dl; N<48 mg/dl), but no malignant cells. The intracranial contents were normal on computed tomography with contrast; however, high resolution cut through the orbits showed an enlargement and irregularity of the belly of the right medial rectus muscle (Figure 2). This was confirmed on coronal cuts and was consistent with metastatic gastric carcinoma. The orbit was neither biopsied nor irradiated; the patient received systemic chemotherapy. She developed progressive diplopia, lower extremity weakness, weight loss, and 1 month later she was unable to adduct the right eye (-4 of 4). She died at home 3 weeks later of widely disseminated disease; no autopsy was performed.

DISCUSSION
Our patient had rapidly progressive, acquired divergent strabismus due to a presumed metastasis from gastric carcinoma to the right medial rectus muscle. Painless, sudden-onset ophthalmoplegia, lid swelling, and ptosis

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with or without vision loss are hallmarks of orbital metastasis. The orbital problem can be the presenting sign of primary carcinoma elsewhere. Acquired strabismus may be a presenting sign in 81% of orbital metastasis, but such a presentation has not been described previously in metastatic gastric carcinoma. The differential diagnosis of acquired limitation of adduction should include metastatic tumor to an extraocular muscle as well as thyroid opthalmopathy, intramuscular hemorrhage, myasthenia gravis, orbital inflammation or primary tumor, internuclear ophthalmoplegia, and acquired partial third nerve palsy.

REFERENCES