Muscular metastasis heralding medullary carcinoma of the thyroid

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Abstract

Medullary thyroid carcinoma (MTC) commonly metastasizes locally to the cervical lymph nodes and distantly to the liver, lungs and bones. Metastatic involvement of the muscles is extremely rare. We report an unusual case of undiagnosed MTC presenting with symptoms related to metastatic lesions of the brachioradialis and the gluteus medius muscles. A 53-year-old man consulted for a painful mass of the right forearm and atrophy of the quadriceps. Ultrasonography revealed a heterogeneous collection in the forearm. Computed tomographic scan showed a mass in the right lung, an enlargement of mediastinal lymph nodes and solid masses in the right gluteus medius and the left iliopsoas muscle extending to the left iliac bone. Pulmonary biopsies displayed findings consistent with metastatic MTC. Fine needle aspiration cytology from the right arm swelling revealed a lesion with the same calcitonin immunostaining patterns as the lung metastasis. The diagnosis of multiple metastases (lung, muscle and bone) of MTC is established. The patient has received local radiation therapy and was planned for chemotherapy. Muscular metastases from MTC are rare and although their prognosis is poor, local treatment may be worthwhile.

Introduction

Medullary thyroid carcinoma (MTC) is a neuroendocrine tumor arising from parafollicular C cells that produce calcitonin. It represents only approximately 4% of all thyroid tumors.1 MTC commonly metastasizes locally to the cervical lymph nodes and distantly to the liver, lungs and bone. Metastatic involvement of the muscles is extremely rare. We report the clinical and radiological features of a case of metastatic MTC in the muscles along with a brief review of literature.
ate high level. Although our patient had a MTC with multiple metastases, serum calcitonin was slightly elevated. It is possible that rare forms of MTC go along with mutations in the calcitonin/CGRP gene which might be responsible for the normal or even relatively reduced calcitonin levels. It would be interesting to examine the calcitonin/CGRP gene structure in these patients. In this patient, the tumour showed positivity for calcitonin in the immunohistochemistry which is in line with the latter hypothesis that calcitonin production is active but secretion mechanisms might be altered.

Prognostic factors relevant to outcome in MTC include age at diagnosis, male gender, the initial extent of the disease including lymph node and distant metastases, tumour size, extra-thyroid invasion, vascular invasion, calcitonin immunoreactivity and amyloid staining in tumour tissue. Metastases at unusual sites are typical of dedifferentiation and often arise several years from onset. We reported an unusual case of MTC associated with diffuse initial metastases to the skeletal muscles, lungs and bones. The muscle is uncommonly involved by metastatic disease. The rare cases of muscle metastasis described in the literature are all connected with follicular thyroid carcinoma, and exceptionally with papillary thyroid carcinoma. In this patient, we have considered that the lesions were due to invasion of muscle metastasis towards the bones rather than direct progression of bone metastasis towards the muscular tissues as there was no bone involvement in the arm and there was no pattern of bone metastasis in the iliac bone such as cortical bone reac or marrow changes on CT scan. To the best of our knowledge, this is the first report of a MTC metastasizing to the forearm and thigh muscles. The exact pattern of dissemination to the muscle is not clear from the available literature. It is believed that muscle pH and muscle’s contractile ability contribute to the resistance of skeletal muscles to metastatic disease. Psoas, iliopsoas, paraspinal muscles and proximal musculature of the upper and lower limbs represent the most frequently involved skeletal muscle sites. Although various imaging studies have been used to identify metastasis to muscle, none are specific for differentiating among carcinomas, sarcomas or other muscle disorders. On unenhanced CT scans, muscle metastasis is revealed as an enlargement of the muscle. Occasionally, the findings may be subtle because the tumor is isodense to the surrounding muscle, and contralateral asymmetry is necessary to make the diagnosis. Management of metastatic disease is first orientated towards the relief of symptoms. External radiation therapy is indicated for bone and muscular metastases not amenable to surgery, especially when they are painful or located in the spine, the base of the skull, and in pelvic or long bones. It procures rapid relief of bone and muscular pain, and slower recalcification of bone lesions. This patient underwent a short course of external radiotherapy to the forearm and the thigh with modest relief of pain. Treatment with radioactive iodine is pointless, because C cells do not take up radioiodine and radioactive iodine covalently linked to $^{123}$I-meta-iodobenzylguanidine (MIBG) offers no significant benefit.

Conclusions

In a patient with MTC, although skeletal muscle metastases are rare, it should be considered along with other benign lesions in the differential diagnosis. An accurate diagnosis of this muscular metastasis is important to avoid unnecessary surgical procedures and to implement an appropriate systemic therapy although the presence of skeletal muscle metastases in the setting of disseminated disease offers less hope for curative treatment.
References