

## CASE REPORT

# Multi-modality surgical treatment for an increasingly common patient with morbid obesity and papillary thyroid carcinoma

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## Abstract

The link between obesity and health disorders such as hypertension, diabetes and coronary artery disease is well known. When a morbidly obese patient presents with a new diagnosis of any cancer, it adds to the many challenges both the patient and treating physicians face. Not only is surgical resection of the malignancy more technically challenging, but also post-operative care such as therapeutic radiation and follow-up imaging is limited by the weight and size restrictions of the machines. With time to treatment being a key factor in limiting the progression of disease, standard weight loss techniques such as diet and exercise in the majority of cases take too long or fail to lead to adequate results. We present a case of a 48-year-old female with newly diagnosed papillary thyroid cancer who underwent gastric bypass surgery in order to lose enough weight to undergo radiation therapy to treat her metastatic disease.

## INTRODUCTION

Obesity is a major risk factor for several health-related disorders such as hypertension, coronary artery disease, obstructive sleep apnea, diabetes mellitus as well as multiple different malignancies. In the past three decades, thyroid cancer has become the fastest growing cancer of all malignancies in the USA [1]. Recent studies have brought to light a link between morbid obesity and papillary thyroid cancer [2]. Obese individuals have lower screening rates and longer delay of medical care due to fear and embarrassment of discussing weight-related issues with physicians. Technical problems encountered in investigations may delay diagnosis and management of cancer. These technical issues include weight and size limitations on CT, MRI and fluoroscopy machines. The capacity of the machines is generally limited to 350–550 pounds with

45–70 cm apertures space for diagnostic and therapeutic intervention depending on the type of machine [3].

Furthermore, varying surgical oncology treatment modalities can lead to higher rate of complications. In addition, peri-operative dosing also remains a large challenge with chemo and radiotherapy. Overall, the prognosis of patients with body mass indexes (BMIs) >35 is adversely affected. This emphasizes the importance of a strict diet to aid in the weight loss process both prior to and during cancer management. It also underlines the importance of combining weight loss surgery in select patients with cancer diagnosis.

## CASE REPORT

A 48-year-old Polynesian, morbidly obese female with a BMI of 82, history of HTN, hyperlipidemia, obstructive sleep apnea and

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diabetes type II presented with 2 years of hoarseness. Her medications included Lipitor, Lasix, Indocin, Glucophage, Prilosec, Lantus, Humalog and Lisinopril. She had a 5-year pack per day smoking history as well as an 8-year use of crystal methamphetamine. Physical exam by the patient's primary care physician revealed a small left upper neck mass. She underwent a thyroid ultrasound with FNA biopsy of the mass, which revealed papillary carcinoma of the thyroid. Flexible laryngoscopy revealed narrowing of the patients pharynx related to obesity and limited mobility of the left arytenoid. A preoperative CT scan of the neck revealed two large left peri-jugular lymph nodes with central necrosis. The patient underwent total thyroidectomy with left jugular lymph node dissection. A large tumor was noted at the superior pole of the left lobe of the thyroid, which extended into the tracheoesophageal groove causing damage to the left recurrent laryngeal nerve. Two large abnormal lymph nodes found just lateral to the jugular vein were positive for metastatic papillary carcinoma.

At the time of surgery, the patient weighed 510 pounds. Postoperative radioactive iodine therapy and whole body scan as well as external beam radiation therapy were recommended, however, was deemed unsafe for the patient due to the size limitations of the scanner. Eight months of strict diet regulations by endocrinology yielded a weight loss of 30 pounds and a patient who was still above the scanner capacity. She was ultimately referred to the bariatric surgery clinic and lost another 45 pounds during her 7-month preoperative phase. The patient's weight on the day of her gastric bypass surgery was 421 pounds. Within 2 months, the patient lost 70 pounds and underwent bilateral jugular lymph node dissection for recurrent disease. Within 6 months, the patient weighed 314 pounds and was able to undergo radioactive whole body iodine scan, which revealed residual thyroid tissue in the left side of her neck. She underwent subsequent left radical neck lymph node dissection and debulking of a mass in her posterior triangle.

## DISCUSSION

Prevalence of obesity and incidence of thyroid cancer have constantly increased since the turn of the century. A patient with a BMI of over 35 has a higher risk of all types of thyroid cancers except medullary cancer [1]. Among them, papillary carcinoma of thyroid is most common. Compared with normal-weight subjects, the odds ratio for obese subjects were 4.17 [2]. Although thyroid cancers have lower mortality rates in comparison to other malignancies, obesity adds to the complexity of therapy. As seen with the case discussed above, morbidly

obese patients have delay in their management owing to technical difficulties such as not being able to undergo a CT scan to evaluate the extent of invasion of the surrounding structures or sites of metastasis. In addition, when they do undergo a radiological procedure, the radiation exposure for a satisfactory image is larger than their counterpart with BMI in the range of 18.9–24.9 kg/m<sup>2</sup>. Even after the increase in radiation, there may be artifacts from photon scatter and poor resolution due to increased distance between the machine and the viscera [3].

As for undergoing a procedure, both anesthetic and surgical complications are myriad. Long-time duration for induction of the patient, difficult endotracheal intubations, higher ASA classes, anatomic distortions, minor postoperative complications like wound infection and prolonged duration of surgery and hospital stay add to the list [4]. Comorbidities like diabetes mellitus delay wound healing in obese patients and therefore exceptional wound care is required. The possibility of several step surgeries, lymph node dissections and metastatic disease add to the morbidity. Delaying the management may increase chance of metastasis and lower the survival rates.

To combat both obesity and cancer, meticulous stepwise care in the overall health of the patient is warranted. It begins with a modified strict diet aimed at weight reduction that also suits the particular patient. Following this, early bariatric surgery consult for either maintaining the lost weight or undergoing a procedure like gastric bypass or sleeve gastrectomy to aid the weight reduction process helps hasten the management. This way the time taken for treatment of both the weight- and cancer-related issues are reduced to a minimum. Psychological support along the entire process with counseling and support groups give the required motivation to follow up with the treating physicians. While morbid obesity poses a greater challenge to cancer management, a multi-modal surgical approach including weight loss surgery should always be considered.

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