

Robot-Assisted Excision of a Cervical Thymic Cyst Mimicking Possible Basal Cell Carcinoma Metastasis

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Abstract

Background: Basal Cell Carcinoma (BCC) is the most common skin malignancy in the head and neck area, cervical metastasis is not common but the risk still remains and cystic lesion had been reported. Cervical Thymic Cyst (CTC) is also a rare disorder. This report aims to describe a clinical puzzle of a CTC in an adult patient with history of facial BCC. We also introduce the new developed robot-assisted surgery for cervical excisional biopsy that is prerequisite for a definite pathologic diagnosis.

Case reports: A 39-year-old woman with history of naso-labial fold BCC presented with a cervical cystic mass. To exclude the possibility of cervical metastasis, the robot assisted excisional biopsy was done via retro-auricular approach to avoid leaving a visible cervical scar. The lesion was proved to be a Cervical Thymic Cyst (CTC), which is rarely found in adults and she was satisfied with the invisible scar hidden in the hairline.

Conclusion: For a neck mass with undetermined malignant potential, the robot-assisted excisional biopsy via retro-auricular approach is a good alternative with better cosmetic result.

Keywords: Basal cell carcinoma; Neck metastasis; Robot-assisted surgery; Cervical thymic cyst

Introduction

Basal Cell Carcinoma (BCC) is the most common skin malignancy in the head and neck area of humans [1]. BCC develops from the basal layers of the epidermis and hair follicles. It is slow growing, locally invasive, and destructive [2]. Although metastasis of BCC is uncommon, the risk of metastasis ranges from 0.0028% to 0.55% in the literature [3]. The most common site of BCC metastasis is the regional lymph nodes, followed by the lungs, bone, distant skin and liver [2,4].

Cervical Thymic Cyst (CTC) is a rare disorder. In the sixth week of embryonic development, the thymus gland develops from the third and fourth pharyngeal pouches. From the seventh to tenth weeks, the primordial thymus migrates caudally and medially into the mediastinum [5]. Thymic gland anomalies in the neck are the consequences of an arrest in the descent of the gland, sequestration of the thymic tissue, or failure of involution [6]. Because the thymus atrophies after puberty, most lesions occur during the first decade of life. CTC is also uncommon in the differential diagnosis of neck mass in adults [7].

We report here a female adult who had history of nasolabial fold BCC and received BCC excision just a year before a cervical lesion was noted. To rule out the risk of BCC cervical metastasis and avoid a visible scar, we performed robot-assisted neck surgery [8], and the cervical cystic lesion was proved to be a CTC.

Case Report

A 39-year-old woman had history of left nasolabial fold BCC after excision and local flap reconstruction by plastic surgery in December 2013. Although the frozen section at deep margin was reported to be negative of malignancy but the permanent deep margin of en-bloc specimen was involved by the tumor. Although under close follow-up without primary site recurrence, she presented to our clinic in February 2014 because she had noticed an asymptomatic enlarging nodule on the right neck two months earlier. Flexible laryngoscopy showed no upper aerodigestive tract anomaly. Physical examination revealed a

hard ovular painless nodule about 2 cm in diameter on the right side level II neck carotid artery region. CT demonstrated a nodule about 20 mm in diameter with central cystic change (Figure 1). A diagnosis of congenital cyst, or a centrally necrotic metastatic lymphadenopathy,

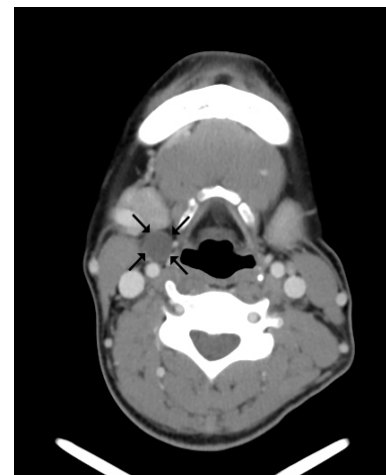


Figure 1: Pre-operative computed tomography showed a cystic lesion (arrows) surrounded by the right submandibular gland, sternocleidomastoid muscle and carotid artery.

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could not be confirmed by radiologic appearance alone. A fine needle biopsy was also impossible due to potential blood-vessel damage for this lesion. The risk of cervical metastasis from BCC was relatively low in literature, but the patient was still concerned about it because of deep BCC with aforementioned positive deep margin on specimen. In addition, she did not want a visible cervical scar, which could result from conventional trans-cervical excisional biopsy. Therefore, we suggested a modified facelift approach to be performed via da-Vinci robot-assisted surgery (daVinci Si System, Intuitive Surgical, Inc., Sunnyvale, CA, USA). The patient agreed to the operation and signed the informed consent form. The surgical procedure was initiated with a 4-cm incision along the right side post-nuchal hair line (Figure 2A) and a surgical tunnel was created underneath the skin to reach the anterior border of the sternocleidomastoid muscle. The Modena retractor system (Ceatec Medizintechnik GmbH, Wurmlingen, Germany) was used to fix the surgical tunnel (Figure 2B) and then the robotic arms were inserted into position within the surgical field. A dual-channel endoscope was placed at the center and Maryland forceps along with harmonic curved shears were used to perform dissection around the lesion under three-dimensional endoscopic magnification (Figure 2C).

The $3.5 \times 2.1 \times 1 \text{ cm}^3$ cystic lesion was successfully dissected from the common carotid artery and sternocleidomastoid muscle (Figure 2D). Histopathological examination revealed adipose tissue with ectopic thymic islands composed of cortex, medulla and Hassall's corpuscles. Multiple cystic spaces lined by squamous epithelium with thick fibrotic walls were found in the ectopic thymic tissue (Figure 3). After the operation, the wound healed well without complications. The scar is hidden under the patient's hair, so there is no visible cervical scar (Figure 4).

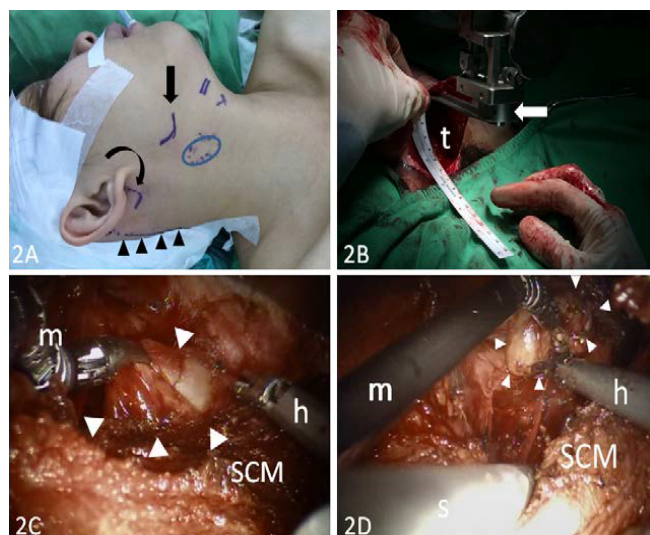


Figure 2: Surgical pictures of robot-assisted excision of the cystic lesion (2A) The post-auricular incision line (arrow head), mastoid process (curved arrow), mandible angle (arrow) and location of cystic lesion (blue circle) were marked on patient's neck before surgery. (2B) The Modena retractor (arrow) was used to fix the surgical tunnel (t). (2C) The cystic lesion (arrowheads) was located underneath the anterior border of sternocleidomastoid muscle (SCM). The Maryland forceps (m) was used to grasp the cyst and harmonic curved shears (h) was used to dissect along the cyst. (2D) The cystic lesion (arrowheads) was successfully removed from sternocleidomastoid muscle (SCM) and a suction (s) controlled by assistant was used to depress the SCM to obtain better exposure of surgical field.

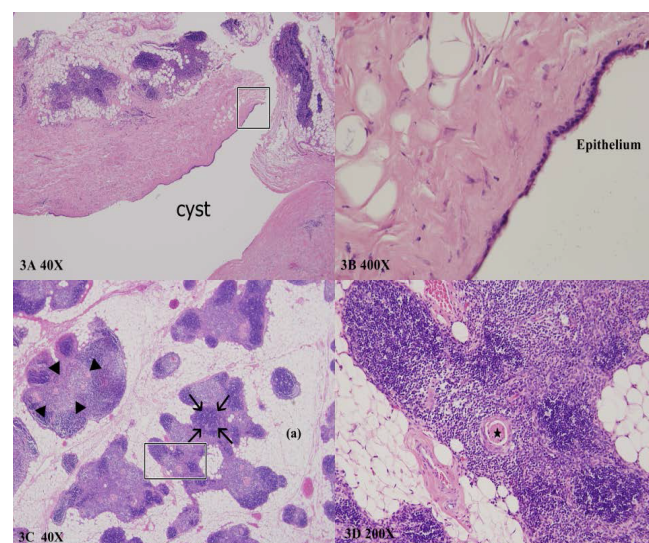


Figure 3: Histopathological findings of the cervical thymic cyst. (3A) Cystic space lined by squamous epithelium. (3B) Image of 400x magnification in the box of figure 3C. (3C) Ectopic thymic tissue enclosed by a thin fibrous capsule surrounding the cortex (arrows), medulla (arrowheads) and adipose tissue (3C). (3D) Image of 200x magnification in the box of figure 3C. Hassall's corpuscles (star) was found in medulla. They represent epithelial cells aggregated into concentric onion-skin layers of keratinized cells.



Figure 4: The wound along the hairline healed well (A) and was hidden under the hair (B) without visible cervical scar.

Discussion

The differential diagnosis of cervical cystic masses includes thyroglossal duct cysts, branchial cleft cysts, hemangioma, dermoid cysts, ectopic thyroid cysts, thymic cysts and cystic metastasis of the lymph nodes [9]. Our patient had a cervical cystic lesion with hard palpation located beside the carotid artery, which is a common sign in metastatic lymphadenopathy. According to her naso-labial fold BCC history, a pathologic confirmation of the neck mass was indispensable.

Although metastasis of BCC is uncommon, the risk of metastasis ranges from 0.0028% to 0.5% in the literature [3]. Metastatic BCC is categorized based on the extent of disease spread as either distant

metastasis or regional metastasis. In distant metastasis, the lung is the most commonly involved organ. For regional metastasis, lymph node metastasis is the most common site and accounts for about 78% of cases [10]. In our patient, the cystic lesion adhered to the carotid artery, so fine needle aspiration was not attempted for fear of accidental injury to the great vessels. Although some reports described the diagnostic criteria for metastatic BCC by fine needle aspiration cytology, the diagnosis of a metastatic BCC in such preparations is difficult since the architectural pattern may be unusual and atypical, and the cell morphology may be altered greatly [11]. In the literature, a report described metastatic BCC that presented as a cervical cyst [4]. For this patient, excisional biopsy was the best management to exclude possible metastatic malignancy. Fortunately, our patient had no BCC cervical metastasis after surgery. But the mass was proved to be a CTC that is rare in adults [9].

Traditionally, a cervical mass was usually excised via a cervical incision on the site of the mass could leave an undesirable scar. Recent technological advances have provided alternative and innovative approaches to cervical lesions including thyroid glands, submandibular glands or other neck masses aimed at reducing cosmetic sequelae [12-14]. For upper neck masses, the remote retro-auricular hair line endoscopic approach has been proved to be feasible with excellent cosmetic outcomes [15,16]. The cervical scar can be hidden behind the auricle and hair. With the advent of surgical robotics [8], the highly articulated robotic arms with 7 degrees of freedom under a three dimensional magnified view allow the surgeon to manipulate the endoscopic devices efficiently with increased technical convenience within the narrow working space (Figure 2). In our case, the incision line could be modified all along the hair line and minimally reduced to about 4 cm in length (Figure 4). The patient had no post-operative complications and is very happy about the cosmetic result.

However, the robot assisted endoscopic approach for excisional biopsy also has drawbacks. The cost of the da Vinci robot is high and robot is not always available in every medical institute. In addition, our patient has to pay about USD 3000 to reimburse the surgery. Obviously, high cost is the obstacle to popularization of this technique. In addition, although port-site metastasis is an extremely rare complication of robot assisted laparoscopic surgery, port site metastases have been reported after robot assisted laparoscopic surgery for cervical cancer, gallbladder cancer and urinary bladder cancer [17]. Different from laparoscopic approach, our approach is a gasless technique and there is no port site skin puncture because 3-D endoscope and surgical instruments could be inserted directly into the post-aural 4-cm incision wound. However, the possibility of tumor seeding during endoscopic approach for a potentially malignant lesion still exists, and careful dissection must be warranted.

Although cervical metastasis of Basal Cell Carcinoma (BCC) is not common, the risk of metastasis still remains in patients with history of deep BCC. Adult CTC cases are rare and the unusual presentation makes this one interesting. For patients with neck mass and excisional biopsy is indispensable, robot-assisted surgery provides an alternative approach to obtain pathologic proof and a better cosmetic result.

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