

CASE REPORT  
OPIS PRZYPADKU

## DIAGNOSTIC PROBLEMS ACCOMPANYING BRANHYOGENIC CANCER – A CLINICAL CASE

DOI: 10.36740/WLek202003140

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### ABSTRACT

Tumours and tumorous lesions of head and neck account for 10% of all oncological pathologies. Branhyogenic cancer is found in 4.5% of patients with lateral cysts in the neck. The article highlights the results of research the clinical case of branhyogenic cancer, provide its clinical and morphological analysis. The aim of our work was to study the clinical case of bronchial cancer, providing clinical and pathomorphological analysis. Examination and treatment was conducted in accordance with the clinical protocol using the diagnostic criteria necessary for management of patients diagnosed with tumours and tumorous lesions in a particular clinical case. We applied ultrasound examination of the locus, angiography of head and neck vessels with tomohexol and with 3D reconstruction, histological examination of surgical specimens (macroscopy and microscopy). On the basis of clinical investigation, ultrasound examination, angiography clinical diagnosis was formulated – lateral cyst on the left side of the neck. A radical surgical removal of the mass was conducted. Histopathological conclusion: there is a proliferation of cystic transitional cell epithelium with the locus of invasive squamous cell carcinoma in the cystic wall that suggests malignant transformation of bronchogenic cyst. Final diagnosis: branhyogenic cancer.

Thorough examination and analysis of a clinical case demonstrates that the development of branhyogenic cancer, is histo-genetically associated with lateral cysts in the neck. Complexity of diagnosing and high percentage of malignancy induces to more early discovery and removal of lateral cysts in the neck.

**KEY WORDS:** branhyogenic cancer, lateral cysts in the neck

Wiad Lek. 2020;73(3):614-618

### INTRODUCTION

Prevalence rate of oncologic pathology grows increasingly. In the structure of morbidity of malignant tumours the neck lesions do not constitute a very high percentage – tumours and tumorous lesions of head and neck account for not more than 10% of all oncological pathologies [1]. Branhyogenic cancer (BC) is found in 4.5% of patients with lateral cysts in the neck (LCN) [2]. The incidence of LCN and BC in men and women is equal. BC is more often diagnosed in people aged over 50 years, LCN is diagnosed in between the ages of 20 to 50 years [3, 4]. BC, defined as squamous cell carcinoma, is associated with abnormalities of gill slits and was first described by Folkman in 1882 [5]. Differential diagnostics of BC and LCN quite often is a complicated task. In the early stages of these diseases there are no complaints, later on – carcinomatous mass appears on the lateral area of the neck which is increasing gradually. Duration of disease (from the moment of discovering a tumour until surgery) is different: up to 6 months – 71.8% of patients, from 6 months to 1 year – 15.4%, more than 1 year – 12.8% [6]. BC quickly grows in the surrounding tissues, its mobility becomes limited, and precision of contours becomes lost. Palpation is painful, the surface is nodular. Metastases to the lymph nodes are rarely observed.

LCN constitute nearly 1.4% -2.2% of all dental diseases, 5% of all lesions of the face and neck and 25% of all soft tissue cysts of maxillofacial area [7, 8]. Pathogenesis of LCN has been studied by the specialists for the past 2 centuries and today it is inter-

preted contradictorily. Scientists put forward bronchogenic, “thymic” limphoepithelial, genetic theories and the possibility of LCN occurrence under the influence of various teratogenic factors during the first weeks of pregnancy [9, 10, 11].

BC and LCN have typical localization: in the upper, just at the angle of the lower jaw (33%) or middle third of lateral area of the neck (67%) on the inner edge of sternocleidomastoid muscle, directly on the neurovascular bundle of the neck at the level of bifurcation of the common carotid artery, sometimes partly extending under the muscle. Tumours are adjacent to the internal jugular vein [12, 13].

Diagnostics of BC and LCN neck cysts cause some difficulties for the physicians. In 9-11% of cases the diagnosis of LCN, with which patient is sent to the hospital does not coincide with the clinical or postoperative diagnosis [14]. Such a high percentage of wrong diagnoses can be explained by scant clinical picture of these tumours and the lack of information obtained during the analysis of diagnostic methods [15, 16, 17].

Diagnostic puncture biopsy of tumours conducted before surgery is recognized by most authors as ineffective due to possible contamination of surgical field's tissues, in addition, it should be noted that conducting puncture and/or incisional biopsy in this area may be associated with the risk of bleeding [18]. In case of LCN the precision of ultrasound examination constitutes 45-50% [19]. There are a lot of diagnostic methods for tumours, but the gold

standard in oncology is considered to be histological study of the obtained material, since only this method enables to clearly identify a tumour. Some authors argue that the diagnosis of BC bears a theoretical and hypothetical character. Thus, the diagnosis itself remains controversial up to the present day [20, 21].

Bronchogenic cysts which were not diagnosed in time, prone to malignancy. This determines the relevance of early diagnosis and treatment of patients with tumours of the neck. A clinical case with tumour in lateral neck area is described in this study.

## THE AIM

To study the clinical case of branhyogenic cancer, provide its clinical and patomorphological analysis.

## CLINICAL CASE

The patient P., 38 years old, hospitalized to the Maxillofacial Surgery Department of Clinical Hospital of Emergency Medical Care in Lviv with complaints on the tumour in the submandibular and lateral neck areas on the left side. Provisional diagnosis: chronic lymphadenitis of submandibular and lateral neck areas. The diagnostics of the disease included clinical data, ultrasound examination, angiography of head and neck vessels with tomohexol and with 3D reconstruction, histological examination of surgical specimens (macroscopy and microscopy). Microscope Nikon E200 with photcamera Nikon 5000 of  $\times 80$ ,  $\times 200$  and  $\times 400$  zoom was applied for taking micro photos. The patient underwent radical surgery.

According to the words of the patient, 1.5 years ago painless swelling in the left side of the neck appeared increasing gradually. Diagnostics was based on clinical data and the results of additional investigation methods. General physical examinations and plain chest radiography were done without presence of abnormalities. The skin over the tumour was not changed in colour, mobile. The tumour was of tight elastic consistency, painless, limited, rounded, with a smooth surface. The formation was painless, undulated during palpation, pulsation of the carotid artery was not transmitted. When turning head in the opposite direction bulging of sternocleidomastoid muscle became well contoured at the front (Fig. 1).

The tumour did not cause compression of organs located around it: there was no breathing difficulty, no violation of swallowing, no dry cough, dystonia. Lymph nodes of the skull, facial, genian, submandibular, neck lymph nodes were non-palpable. Data of ultrasound examination: on the left side of the lateral neck area there were liquid heterogeneous formations with d from 30 mm to 20 mm (3 pieces) with the capsule, limited, with no blood circulation. No enlargement of lymph nodes. Description of angiography examination: the thyroid gland was located typically, of normal shape and size. Neck lymph nodes were not enlarged. At the level of bifurcation of the external carotid artery on the left side two clearly

contoured formations containing liquid with density of 27 HU, with clear outer contour and uneven inner contour, with accumulation of contrast medium in the form of the wall up to 25 mm was visualized. On the upper contour of tumour another tissue formation of homogeneous structure with signs of accumulation of contrast up to 17 mm was visualized. Formations were located under the front edge of sternocleidomastoid muscle. On their inside retromandibular vein and external carotid artery passed (Fig. 2, 3, 4).

Conclusion: cystic tumours may correspond to the cysts of the second gill arch (second bronchial cleft cysts). On the basis of the obtained data a clinical diagnosis was formulated – lateral cyst on the left side of the neck. Under endotracheal anaesthesia surgery on removal of tumour of the lateral area on the left side of the neck was conducted. During the surgery, special attention was paid to manipulations near the vascular-nervous bundle of the neck and radicality of intervention itself. After antiseptic preparation of the surgical field a cut on the front edge of sternocleidomastoid muscle, with the length of 10 cm, extending to the ear lobe, was made; skin, subcutaneous tissue, superficial muscle of the first and second neck fascia, neurovascular case were passed by, formation allocated in the membrane, with the size of about  $8.0 \times 4.0$  cm containing liquid, that occupied submandibular area and lateral neck area was detached (Fig. 5, 6).

On the inside it was adherent to the membrane of external carotid artery, along it, retromandibular vein delegation was conducted and peripheral branches of the facial nerve were detached. Haemostasis. The wound was stitched with nylon 3-0 layer by layer, Vicryl sutures, drainage were put on the skin. Pressing aseptic bandage. Tumour in the capsule was sent to histopathological study. Macro and microscopy description: the researched surgical specimen is presented by hollow formation of pink-red colour  $4 \times 2.5$  cm, with greenish, viscous content at the crosscut and tumorous formation with d = 1.5 cm of grey colour. Histopathological conclusion: there is a proliferation of cystic transitional cell epithelium with the locus of invasive squamous cell carcinoma in the cystic wall that suggests malignant transformation of bronchogenic cyst (Fig. 7, 8, 9). Final diagnosis: branhyogenic cancer.

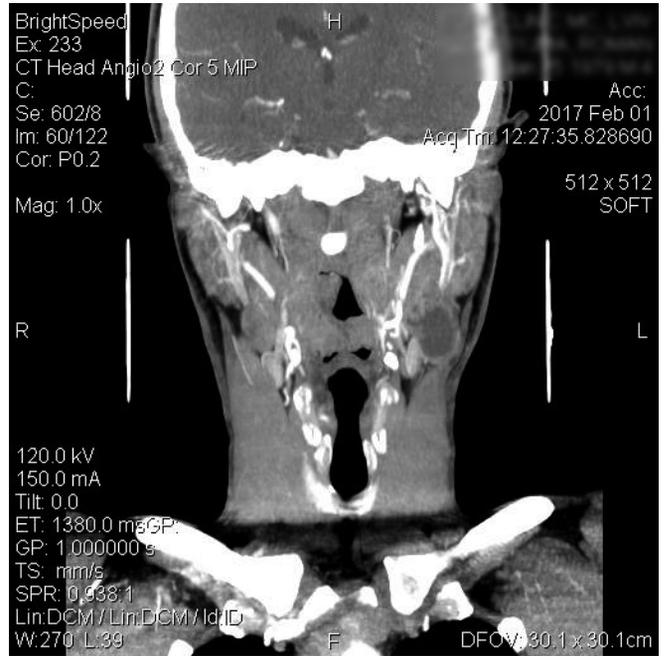
## CONCLUSIONS

LCN and BC have rather similar clinical and morphological picture, require reasonable complex examination and surgical treatment to prevent diagnostic errors and recidivation, and mandatory verification of a tumour. Occurrence of three cystic tumours in one patient is quite rare. The detailed study of clinical case proves that the development of BC is histo-genetically associated with LCN. A metaplasia of epithelium that covers the cyst with further malignancy occurred.

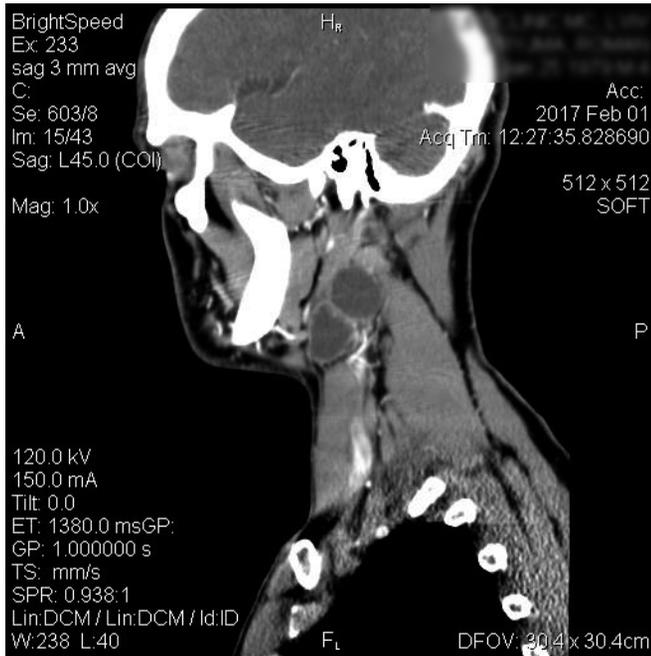
To sum up, we may state complexity of diagnosing and high percentage of malignancy induces to more early discovery and removal of LCN.



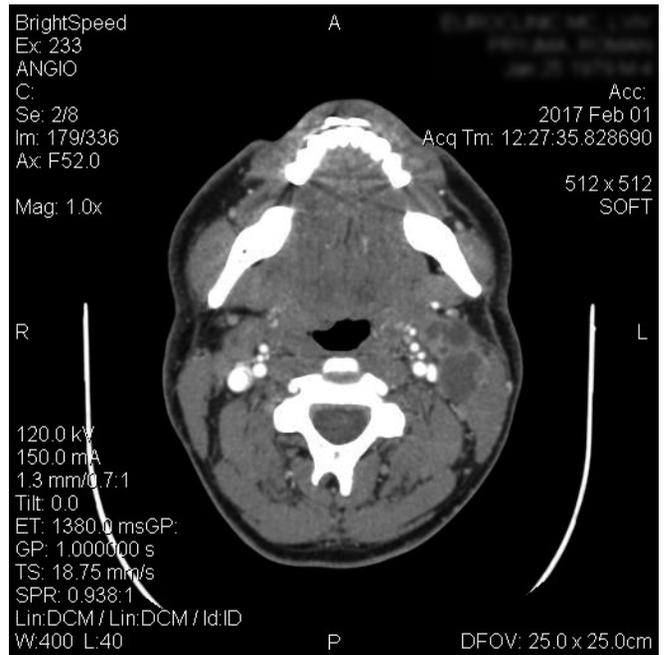
**Fig 1.** The general appearance of the patient suffering from the Branhyogenic cancer



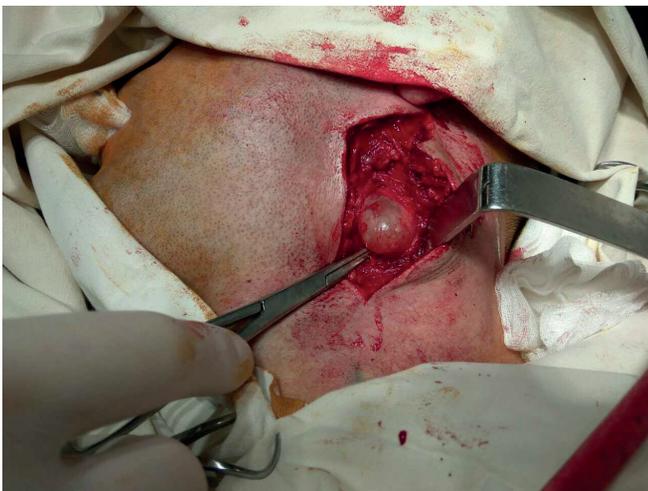
**Fig 2.** Plan angiography of head and neck vessels



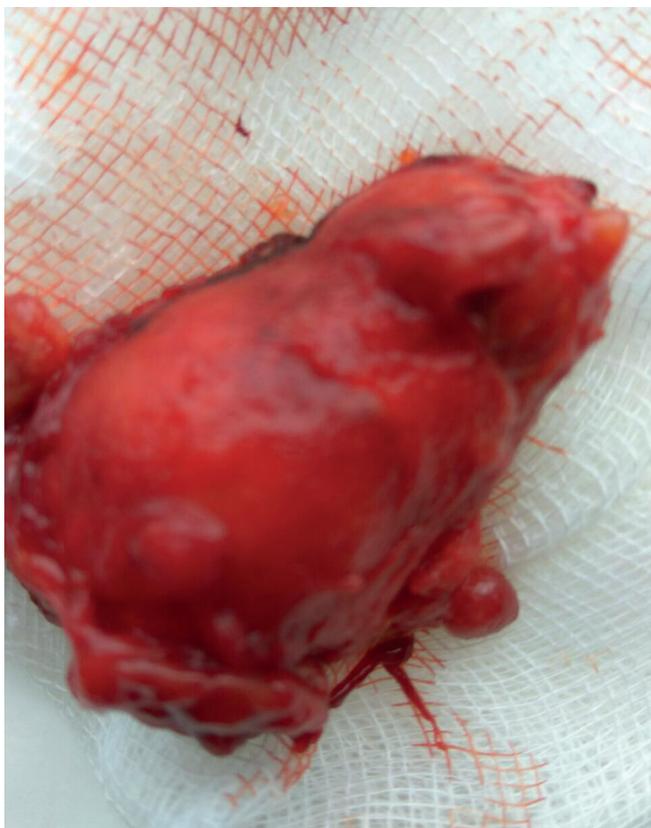
**Fig 3.** Plan angiography of head and neck vessels



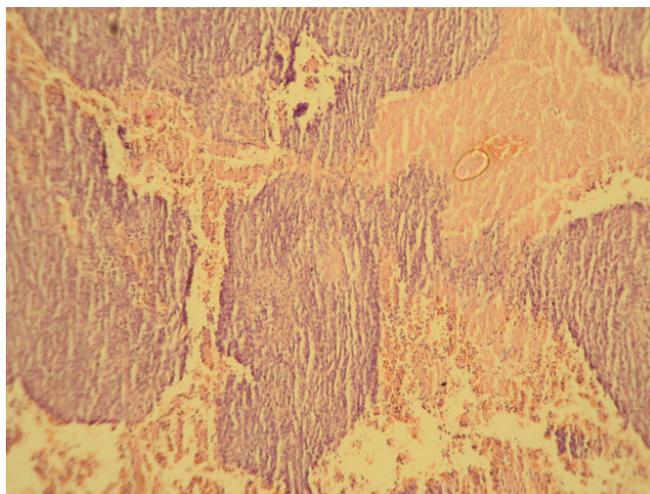
**Fig 4.** Plan angiography of head and neck vessels



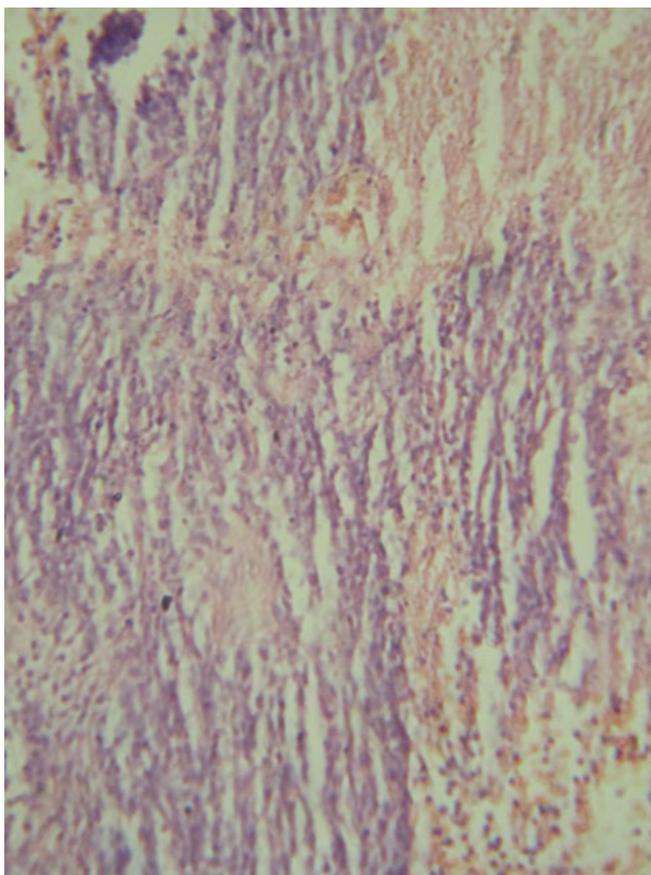
**Fig 5.** Intraoperative image of of the Branhyogenic cancer to surgical excision.



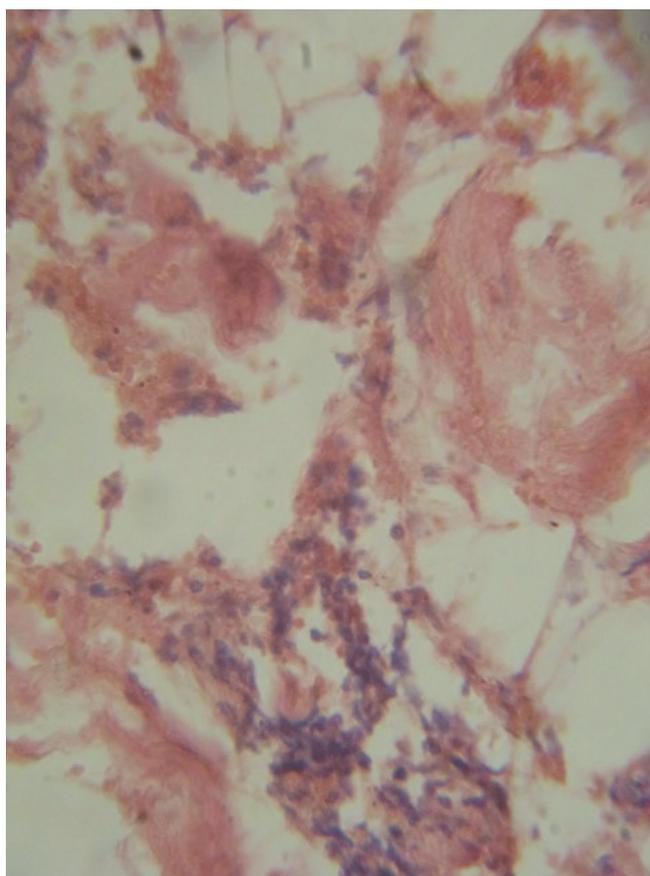
**Fig 6.** Branhyogenic cancer



**Fig 7.** Branhyogenic cancer. Histological study № 3443–2/2017 (H&E, × 80)



**Fig 8.** Branhyogenic cancer. Histological study № 3443–2/2017 (H&E, × 200)



**Fig 9.** Branhyogenic cancer . Histological study № 3443–2/2017 (H&E, × 400)

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*Correlation of publication with scheduled academic research works. The present manuscript is a fragment of the complex scientific theme of the Department of Surgical Dentistry and Maxillofacial Surgery: "Search, implementation and ways of improving the methods of diagnosis and treatment of inflammatory, traumatic processes, defects and deformities of the maxillofacial area", state registration No. 0115U000046.*

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### Conflict of interest:

*The Authors declare no conflict of interest:*

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**Received:** 17.01.2020

**Accepted:** 05.03.2020

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**A** – Work concept and design, **B** – Data collection and analysis, **C** – Responsibility for statistical analysis, **D** – Writing the article, **E** – Critical review, **F** – Final approval of the article