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ORIGINAL ARTICLE

Atypical Jaw-bone Metastases: A 20-year Retrospective Analysis

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ABSTRACT

Aim: To present a group of the most interesting cases of tumors of jaws metastasized from distant sites, like prostate, urinary bladder (vesica urinaria), and breast, treated at our clinic during the last few years.

Materials and methods: In this retrospective study from 1994 to 2014 (a period of 20 years), among the patients treated at the University Clinic for Maxillofacial Surgery in Skopje, we found four patients with rare and unique jaw metastasis.

Results: All four patients with diagnosis were confirmed clinically, radiographically, and histopathologically before and after the treatment. One of them was female with metastasis from breast to the mandible. The second was a male with breast cancer metastatic to maxilla. The third was a male patient with prostate carcinoma metastasizing to the mandible. And the last one was again, a male patient with maxillary metastases from cancer of the urinary bladder (vesica urinaria). In our series, the most common primary site for both males and females was identified as the breast. All aforementioned patients underwent a successful operative treatment in the maxillofacial area, but the diagnosis permitted treatment of the original cancer as well.

Conclusion: Our results indicate that jaw-bone malignant metastases are a relatively rare finding, considering the incidence of metastatic tumors in the body, and prognosis is reserved for the pathophysiology of the primary tumor and treatment in the metastatic region.

Keywords: Breast cancer, Mandible, Maxilla, Prostate cancer, Vesica urinaria cancer.

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INTRODUCTION

Metastatic lesions to the hard and soft tissues of the maxillofacial region are rare and represent only 1% of all orofacial tumors.[1-6] Numerous studies indicate that in most cases, the primary site appeared to be the breast, kidney, reproductive organs, and thyroid gland for females, but in males they originate from the prostate, lung, kidney, colorectal region, and skin.[7-13] The bones affected by extraoral tumors are mandible and maxilla and the most frequent form of tumor that metastasizes is breast cancer. The mandible is the most common bony site involved and it is usually unilaterally affected, but sometimes bilateral metastases have been recorded; maxillary metastases are less common.[11,14] Probably, because it is most common in all female-specific malignancies, metastatic disease of the breast to the jaws, particularly the mandible is the most common of all maxillofacial metastases.

MATERIALS AND METHODS

This is a retrospective study of the files of four patients with a literature review, presenting the experience of our Department of Maxillofacial Surgery over a period of 20 years (1994–2014). Data were collected directly from the medical records and history of the University clinic, including gender, age, site of primary tumor, metastasis, and treatment of the lesion.

RESULTS

All four patients with diagnosis were confirmed clinically, radiographically, and histopathologically, and the most common primary site for both males and females was identified as the breast, with the most common cancer being breast carcinoma. Age of the patients ranged from 43 to 76 years, with a mean age of 59. The patients were completely treated for both primary tumor and single metastasis. The clinicopathological characteristics of our patients are presented below.

The first patient, a 43-year old woman was referred to our clinic presenting with metastatic breast carcinoma to mandible. Radical excision was performed by combined lateral and midline approach, including partial surgery, to remove part of the mandible (mandibulectomy). Pathologically, there was a metastatic multilobulated tumor with a length of 3 × 2 × 2 cm. The cells were arranged in a collagenous stroma with pleomorphic nuclei and numerous atypical mitoses (Fig. 1).

The second one was a 43-year-old man presenting with metastatic breast carcinoma to maxilla and treated in our clinic. Radical approach was performed with total surgical removal of one entire side of the upper jaw, including maxilla and hard palate (hemimaxillectomy). Pathologically, there were anaplastic cells in osseous tissue of maxilla arranged in cords and nested with hyperchromatic nuclei and sparsely seen mitotic cells (Fig. 2).

The third patient was a 76-year-old man with a primary prostatic carcinoma and metastatic cancer to the right side of mandible. Tumor resection with surgical removal of one lateral half of the mandible was performed (hemimandibulectomy). Histologically, there was a neoplastic proliferation in osseous tissue of mandible arranged in solid and alveolar pattern. The cells were large with clear cytoplasm and pleomorphic hyperchromatic nuclei. Around osseous tissue there was osteoblastic activity (Figs 3A and B).

The last one was a 74-year-old man referred to our clinic with a primary urinary bladder cancer that metastasized to the maxilla. Radical hemimaxillectomy with midline transfacial approach was performed with total extirpation of the tumor. Histologically, there was solid and papillary pattern of tumor tissue with destruction of osseous maxillary tissue. Papillary structures showed multilayer transitional epithelium with anaplastic features (Figs 4A and B).

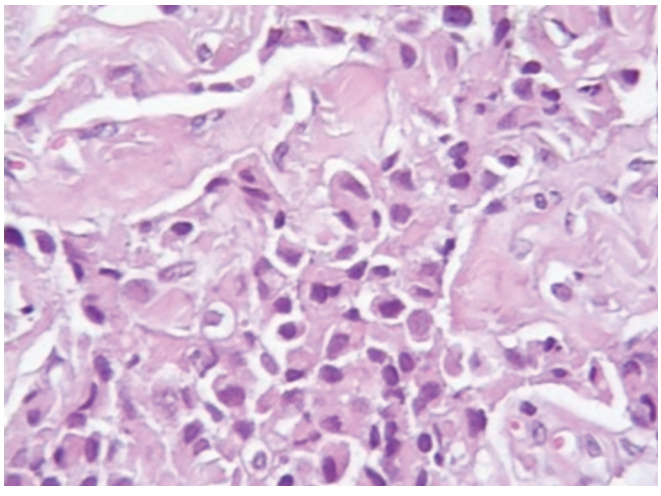


Fig. 1: The cells are arranged in a collagenous stroma with pleomorphic nuclei and numerous atypical mitosis

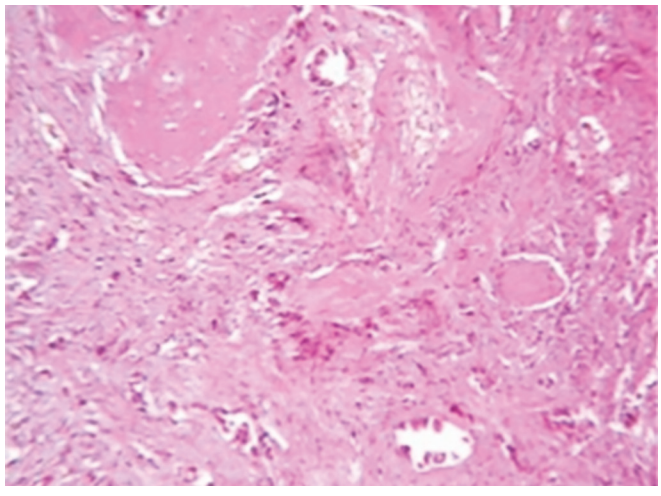
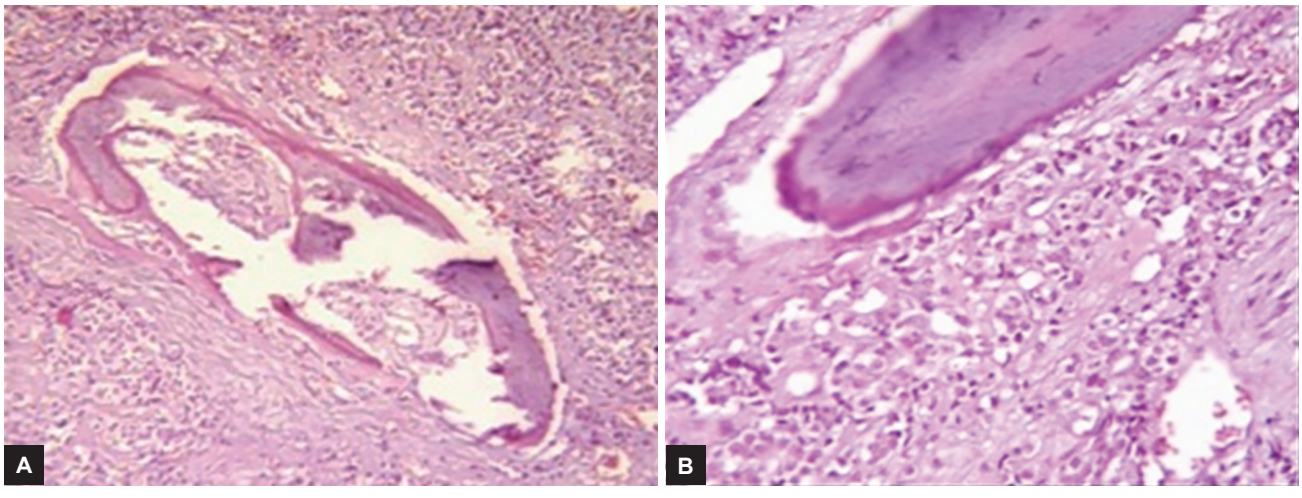
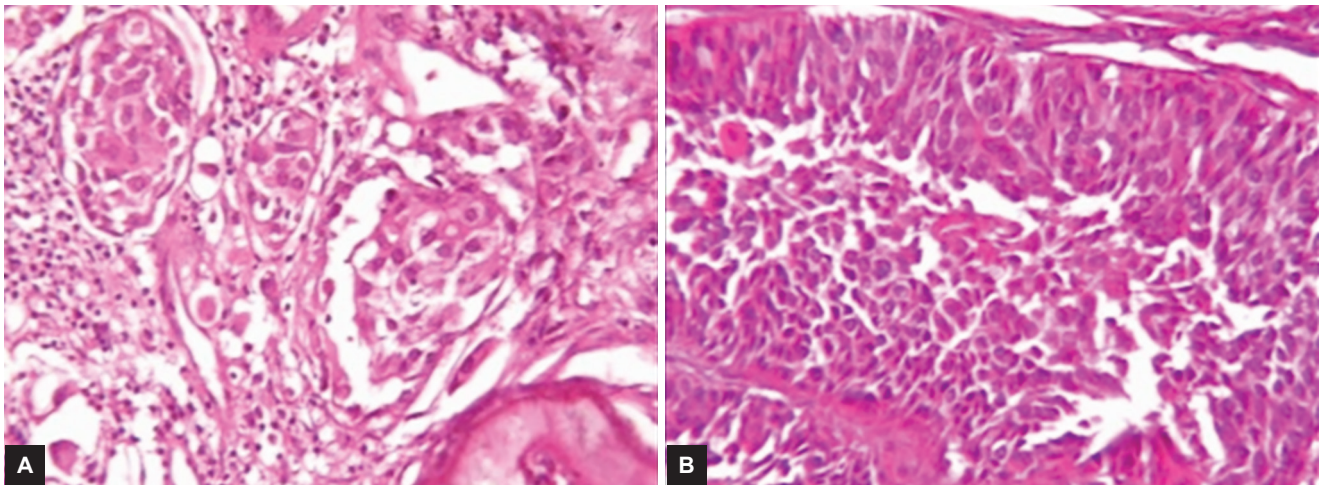


Fig. 2: Anaplastic cells in osseous tissue of maxilla arranged in cords and nests with hyperchromatic nuclei and rare mitosis



Figs 3A and B: Neoplastic proliferation in osseous tissue of mandible arranged in solid and alveolar pattern. Cells are large with clear cytoplasm and pleomorphic hyperchromatic nuclei. Osseous tissue shows osteoblastic activity



Figs 4A and B: Solid and papillary pattern of tumor tissue with destruction of osseous maxillary tissue. Papillary structures show multilayer transitional epithelium with anaplastic features

DISCUSSION

There have been several published series reporting the metastatic pattern resulting from carcinoma of the prostate, urinary bladder, and breast. The above cases that presented in our clinic show an association between extraoral tumors from prostate, urinary bladder, breast carcinoma, and the gnathic bones. Many types of primary malignancies can produce oral metastases. Malignant metastatic tumors in the oral cavity, maxilla, and mandible from the original cancer are exceedingly uncommon. In fact, they are rare comprising 1% of all malignant mouth neoplasms, and can have devastating implications for the patients.[11,14,15] The metastatic tumors usually involve the jaws, but may also be found in the other anatomical structures of maxillofacial area.[14,16] Mandible bone is affected more than the maxilla, including the body – molar region and ramus.[3,5,11,17,18] Comparatively, the jaw bones are more commonly affected than the oral soft tissue (2.5:1 ratio).[1,6] The most affected anatomic area of oral soft tissue is attached gingiva with 54%, followed by tongue, lips, buccal, and palatal mucosa.[2,19]

Age and sex can be helpful in providing substantial clues to an eventual location of a primary lesion. The male to female ratio in most studies oscillate at 2:1 or almost equal, and they can mostly be detected in aged between 40 and 70 years old.[6,7,11,20]

On careful literature review with a focus on clinical signs and symptoms, it is seen that they may be present asymptomatically like a recurrent lesion at the same site, to simulate a periapical lesion, epulis, palatal, gingival, or submental swelling and in most of the cases they are present with anesthesia or paresthesia, especially involving the trigeminal nerve, branch of mandible, or alveolar inferior nerves.[3-5,11,14,20,21] According to Kumar and Manjunatha, metastasis may potentially develop after extraction, because tooth extraction can trigger the metastatic process.[11]

The diagnostic protocol is usually established by magnetic resonance imaging, computed scan, and sometimes jaw-bone scintigraphy. The Roentgen views which are requested for diagnosis in maxillomandibular area may be useful in the process of evaluating the extent of the metastasis,[8,9] but biopsy is compulsory.

Several authors have reported mandible metastasis from prostatic cancer.[3,5,10,18,22] In accordance with our reports, this is the same anatomical location as in the patient with jaw metastasis from prostate. Menezes et al[3] have reported that when primary tumor volume is less than 3 mL, the metastasis is rare. Reports from breast cancer literature reviews show that the carcinoma of the breast usually metastasizes primarily to the jaw bones, and secondly involves the oral mucosa.[20] Siriwardena et al, in their clinicopathological details of studies on metastases, demonstrated that prostate and bladder tumors usually metastasize to the mandible and present radiographically as radiolucent destructive lesions.[21] The studies by Siriwardena et al and Cardona et al have reported cases from 68- to 49-year-old men with metastatic transitional cell carcinoma from the urinary bladder to the mandible and rib.[9,15] There is a low incidence of jaw-bones metastasis, uniquely from urinary bladder cancer. Our study showed the metastases from urinary bladder cancer presenting in the maxilla. Metastatic carcinoma from the breast and prostate might stimulate bone formation, and might appear as mixed lesions.[8,23]

In our retrospective analysis, we found four patients of metastatic tumors, and they clinically presented in maxillofacial area. There were three males and one female. Two patients were aged 43, both a male and female, and the others were 74 and 76-year-old males. Most common tumor origin was breast carcinoma, followed by the

prostate and urinary bladder. The metastatic forms in our study were equally represented in maxilla and mandible, and there was no dominance. Regarding the literature, 90% of oral metastases include the mandible or maxilla, and breast cancers have particular affinity for metastasizing to the mandible.[4,19] Our patients were treated with inevitable operative techniques.

CONCLUSION

This retrospective study reports the description of a very rare patients of metastatic prostate, urinary bladder, and breast carcinoma to the gnathic bone. Jaw-bone metastases are rare findings in these types of carcinoma as shown throughout our 20-year study. Treatment and health care of these patients in the metastatic region should be followed up on a regular basis. Prognosis is reserved for the pathophysiology of the primary tumor.

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Confirmation of patient/parent/guardian or next of kin have viewed and agreed to the submission. Written patient consent has been obtained to publish photographs (photomicrographs). Our work has been approved by the appropriate Ethical committees from Faculty of Dental Medicine, University "Saints Cyril and Methodius," Skopje, Republic of Macedonia.

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