Surgical treatment and dilemmas in the treatment of basal cell carcinomas with intracranial propagation

Hirurško lečenje i dileme pri lečenju bazocelularnih karcinoma sa intrakranijalnom propagacijom

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Abstract

Background/Aim. Basal cell carcinoma (BCC) is one of the most common malignant skin tumors on the head in 90% of cases and is characterized by a high local infiltrating potential and destructive growth. The aim of this study was to show the characteristics of a correlation between pathohistological types of basal cell carcinoma and the size of this lesion, aggressiveness and infiltration of basal cell carcinoma, and its effect on the course of the therapy. Methods. We analyzed 27 patients operated on for BCC that affected the scalp and the bone. We described and considered the clinical characteristics (size, depth of invasion), duration and speed of intracranial propagation and then made comparison with the type of BCC. We described the extent of surgical treatment and the width of excision to determine the best course of the treatment. The patients went through examinations during the next three years. Results. According to the histopathological type the most common tumors were: infiltrative (60.2%), noduloinfiltrative (37.2%), and morpheaform (2.6%). Tumors were clinically manifested as ulcerative lesions, *ulcus rodens* and *ulcus terebrans*. Tumor diameters ranged from 2 to 25 cm. The depth of intracranial propagation depended on the histological type and tumor size. Most relapses (35%) occurred with morpheaform type of BCC. In 17 of the cases, BCC affected the bone without intracranial propagation. In 10 of the cases, basalioma infiltrated intracranial space – in 8 of the cases it infiltrated the dura and in 6 of the cases the brain parenchyma, of which in two of them, the superior sagittal sinus was affected and had to be surgically tied off. Conclusion. The aggressiveness and infiltration of basal cell carcinoma into the brain parenchyma is directly linked to the histological type and the size of the tumor. The larger the basalioma or if histopathological findings confirm morpheaform type of basalioma the larger surrounding healthy tissue, sometimes more than 3 cm in diameter, needs to be removed. In cases of these tumors postoperative radiotherapy is recommended.

Key words:
- head and neck neoplasms; neoplasms, basal cell;
- neoplasm invasiveness; neurosurgical procedures.

Rezultati. Prema patohistološkom tipu karcinoma, najzastupljeniji bili su: infiltrativni (60,2%), noduloinfiltrativni (37,2%) i morfoeiformni (2,6%) tip. Klinički su se manifestovali kao ulcerovne lezije: *ulcus rodens* i *ulcus terebrans*. Veličina tumora kretala je od 2 do 25 cm u prečniku. Dubina intrakranijalne propagacije je zavisila od histološkog tipa i veličine tumora. Najveći broj recidiva (35%) je prirođen kod morfoeiformnog tipa bazocelularnog karcinoma. Kod 17 bolesnika bazocelularnim karcinom nije bilo zahvata kos be bez propagacije intrakranijalnom, a vreme trajanja promene bilo je od jedne do dve godine. Kod 10 bolesnika bazelom je bio prostrano intrakranijalno i to u osam infiltrisao dura, a kod šest moždanih parenhmih, od toga kod dva bolesnika je bio zahvaćen *sinus sagitalis* koji je morao biti podvezan. Zaključak. Agresivnost i infiltracija bazocelularnog karcinoma u moždani parenhmul se u osam infiltrisao dura, a kod šest moždanih parenhmih, od toga kod dva bolesnika je bio zahvaćen *sinus sagitalis* koji je morao biti podvezan. 

Ključne reči:
- glava i vrat, neoplazme; karcinom, bazocelularni;
- neoplazme, invazivnost; neurohirurške procedur.
Introduction

Carcinoma basocellulare originates from pluripotent cells of the basal layer of the epidermis, the outer layer of hair follicles, sebaceous glands or other skin adnex. It is characterized by local infiltrative and sometimes destructive growth. It very rarely gives metastases. In the scalp region a large number of tumorous lesions appear. Some types of cancer can be very aggressive and by location they can be intracranial with extracranial propagation or extracranial with intracranial propagation. One type of tumor that is by localization extracranial and has intracranial propagation are basal cell carcinomas.

There are several histological types of basocellular carcinoma which may be manifested in over a dozen clinical forms. The most aggressive is infiltrating form which is usually clinically manifested as: carcinoma basocellulare ulcerosum (exulcerans) s. ulcus rodens – it appears as a sharply defined ulcerative lesion of various sizes and depths, with irregular edges. The bottom appears as a crater covered with bloody discharge, hypergranulation and crust and easily bleeds. It grows very fast and infiltratively, devastating the surrounding tissue down to the cartilage and bone; carcinoma basocellulare terebrans, s. ulcus terebrans – it develops from ulcus rodens with a deeper and more extensive tissue destruction and decay. The tumor penetrates and infiltrates and destroys the subcutis, fascia, muscles and cartilage, bones. Extensive mutilations and deformities appear with bleeding and secondary infections. They usually occur on the scalp and the middle of the face and are very difficult to treat; carcinoma basocellulare morpheaform (sclerodermiform) – a less frequent clinical form, more common on the head as a small, raised yellow or white plate with a network of telangiectasia on the surface. This type of basocellular carcinoma is radioresistant.

We used multidisciplinary methodology, including the specialist in plastic surgery. Surgical treatment consisted of excision of basal cell changes, and closure of secondary defects with skin grafts and flap reconstruction depending on the location and size. We entered the following data in the protocol: age, sex, lesion diameter, duration and anatomic site. Preparations were placed in 1% formaldehyde and sent to histopathological (HP) verification. After receiving the HP findings we entered in the protocol the data on the presence of tumor tissue at the edges of the resection and the histopathologic type of basal cell carcinoma. On the basis of their clinical characteristics we compared the histopathologic type and the type of basal cell carcinoma and then described the radicality of surgery and the width of excision to determine the best surgical treatment. The patients were followed three years after the surgery. The diagnostic methods we used were computed tomography (CT), magnetic resonance (MR) and 64-multislice CT (MSCT) as a very accurate diagnostic procedure.

Results

Out of 27 analyzed patients with basal cell carcinoma 15 (56%) were male and 12 (44%) female. The age structure of the patients ranged from 82 years to 43 years (with the average age of $\bar{x} = 62$ years). Tumor size ranged from 2 cm to 25 cm in diameter (average value of $\bar{x} = 3.8$ cm). In relation to the anatomic site basal cell carcinomas were usually present in the frontal region (22%), parietal (31%), in the temporal (33%), and in the occipital region (14%). By histopathologic type the most common were: infiltrative (60.2%), nodulo-infiltrative (37.2%) and morpheaform (2.6%). They were clinically manifested as: ulcerative, ulcus rodens and ulcus terebrans (Figure 1). Non-infiltrative basal cell carcinoma (nodular, noduloadenoid and superficial) did not affect the bony part of the scalp and did not make intracranial penetration. The duration of the changes, i.e. the time between noticing and the first consultation with the doctor ranged from 6 months up to 3 years. Tumor sizes ranged from 2 to 25 cm in diameter. The depth of the intracranial propagation depended on the histological type and tumor size. Most relapses (42%) were present in the morpheaform type of basal cell carcinoma. In 17 cases the basalium affected only the bone without intracranial propagation and the duration of changes ranged from one to two years. In 10 cases the basalioma penetrated intracranially (duration of changes over three years), of which in 8 cases the duru and in 6 cases it infiltrated the brain parenchyma, of which in two

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cases the sagittal sinus was affected and had to be tied off (Figure 2). In all the cases with the brain parenchyma invaded we removed basalioma down to the macroscopically and microscopically healthy brain parenchyma and in all the cases we implemented radiotherapy.

Discussion

Despite the fact that basal cell carcinomas are affected by radiation therapy (except for the morpheaform type), cryotherapy, curettage, local cytostatic therapy, retinoids or electrodesection, surgical treatment is the method of choice in the treatment of this type of tumor 5–10. Surgically, the tumor can be entirely removed with safe histopathological checkup and confirmation 11, 12.

The rate of healing in surgical excisions ranges from 85% to 95% 5. Epstein 9 finds that the visual assessment of basal cell carcinoma edges is within 1 mm from the right edge in about 94% of cases, which led him to conclude that the edges of 2 mm give 94% healing. Burg et al. 11 compared the clinical size of the tumor estimated by the naked eye with the right size determined by Mohsov’s micrographic examination and received the distinction of 5.5 \( \pm 3 \) mm in primary basocelular carcinomas and 8.9 \( \pm 4.8 \) mm in recurrent basal cell carcinomas.

Based on the received results and clinical experience we believe that the width of excision and the presence of tumorous cells on the resection lines are in direct correlation with the histological type and size of basal cell carcinoma. So, the adequacy of surgical excision is directly dependent on the type and size of basal cell carcinoma.

We found that in all our cases with the affected scalp bone tissue and intra cranial propagation, it was an infiltrative basal cell carcinoma and all its histological combinations with infiltrative component (no macroscopically visible edge compared to the healthy tissue), and that it required wider excision and depended on the clinical manifestation of the tumor and its size 11, 15–17. If it is the infiltrative type (clinically most often with ulceration and covered with crust) and if it is larger than 1 cm (clinically most often manifested as ulcus rodens or ulcus terebrans) excision should be made into the healthy tissue for about 1.5 cm to 3 cm, sometimes even more.

Noduloinfiltrative histological type is most often clinically manifested as nodus accompanied by tissue decay, ulceration. Because of the clinically present nodus it sometimes misleads in terms of the evaluation of the excision width (therefore a high percentage of the presence of tumor at the resection edge) 17–24. But with this kind, there is no clear visual limits of tumor from healthy skin which requires, depending on the size, at least 5 mm excision into the healthy tissue.

In the morpheaform type of basal cell carcinoma (rate of the presence at resection lines 35%) excisions need to be made into the healthy tissue up to 3 cm from the tumor edge which is not macroscopically clearly defined. In the diagnosis of the width of excision in morpheaform basal cell carcinomas we used 64-slice MSCT.

Conclusion

The aggressiveness and infiltration of basal cell carcinoma into the brain parenchyma is directly linked to the histological type and size of the tumor. The larger the basal cell carcinoma the wider excisions need to be made into the healthy tissue with obligatory removal of the affected bone down to the macroscopically and microscopically healthy brain parenchyma sometimes up to 3 cm in diameter with obligatory postoperative radiological therapy.

References


