Basic surgical procedures for basal cell carcinoma on the forehead – case reports

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ABSTRACT

Introduction. Basal cell carcinoma (BCC) is the most common skin cancer. It consitutes for about non-melanoma skin cancers. Basal cell carcinoma localizes mainly on the face and neck. Forehead belongs to the most common locations. In the treatment of basal cell carcinoma a lot of methods can be proposed, however surgical excision with adequate margins remains the most effective. Depending on the tumor size and location a lot of surgical procedures can be used starting from simple excision, wide range of plasties, second intention healing and skin grafts. The easiest effective method giving satisfying cosmetic results should be chosen. The most frequent reconstructions performed on the forehead are M-plasty, A-T plasty and H-plasty. M-plasty is a modification of simple excision. A-T plasty and H-plasty are based on the local advancement flaps. Cosmetic results are relevant, therefore knowledge of face aesthetic units is important.

Objective. Presentation of the most commonly used methods of surgical treatment of basal cell carcinoma localized on the forehead.

Case reports. We present 3 patients with basal cell carcinoma on the forehead in which M-plasty, A-T plasty and H-plasty were performed.

Conclusions. Surgery is the best treatment option for patients with basal cell carcinoma on the forehead. Simple surgical techniques enable tumour removal with good cosmetic outcomes in the majority of patients.

INTRODUCTION

Basal cell carcinoma (BCC) is the most common human cancer. It accounts for ca. 80% of non-melanoma skin cancers [1, 2]. The incidence of BCC has been growing steadily worldwide over the past decades [2]. Most basal cell carcinomas develop on the skin of the face [1, 2]. The forehead region may account for 20% of facial BCC cases. The best treatment method of basal cell carcinoma in this location is surgical excision of the lesion.

OBJECTIVE

Presentation of surgical techniques that are most commonly used in the treatment of basal cell carcinoma located on the skin of the forehead on the basis of 3 selected cases.

CASE REPORTS

Case 1

An 83-year-old woman presenting with a nodule, 7 mm in diameter, located in the left forehead region, persisting for the past 2 years. Histopathological examination confirmed the diagnosis of basal cell carcinoma. The lesion was removed with a clear margin of normal tissue under local anaesthesia using 1% lignocaine with adrenaline. The classic elliptical excision was modified by incising one end of the wound in the

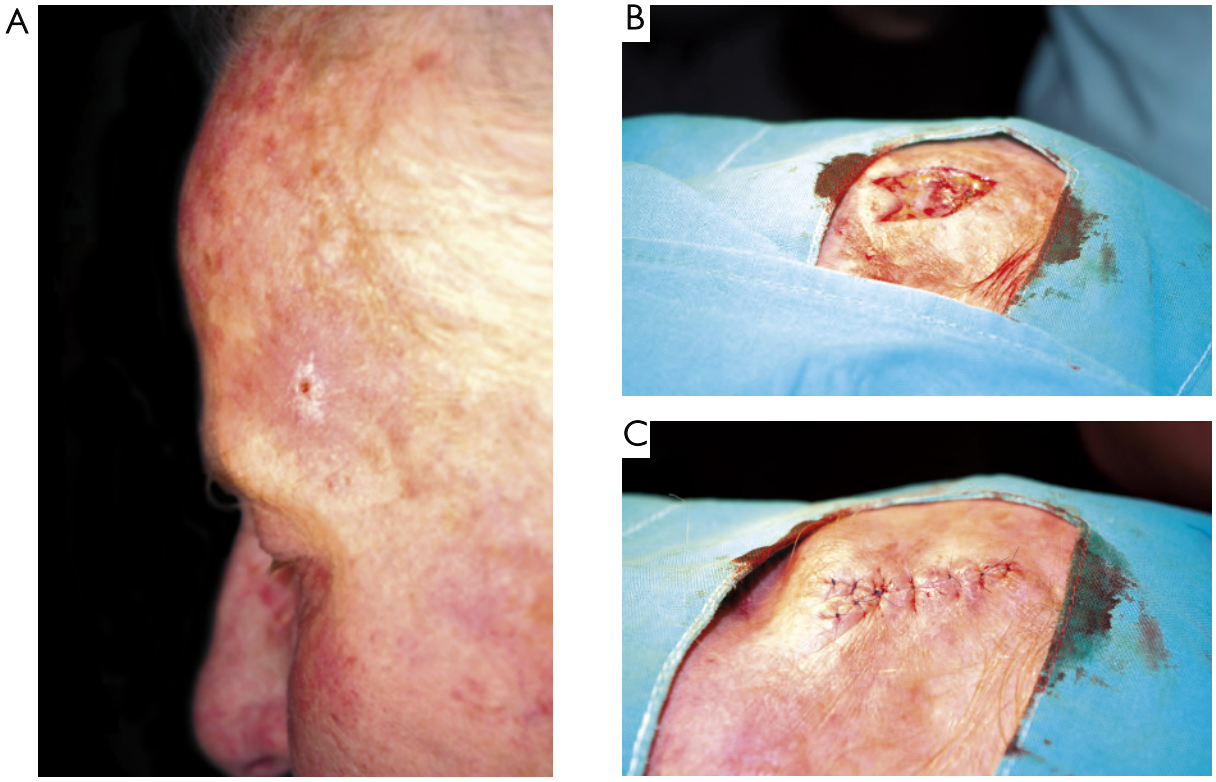

Figure 1. A – Basal cell carcinoma on the forehead. **B** – The lesion was excised using M-plasty technique. **C** – View after wound closure

shape of the letter M. The wound edges were closed with simple non-absorbable sutures (Figs. 1 A–C).

Case 2

An 87-year-old man presenting with a tumour, 12 mm in diameter, located in the midline of the forehead, persisting for the past 6 months. Based on histopathological examination, the nodular form of basal cell carcinoma was diagnosed. The tumour was removed under local anaesthesia using 1% lignocaine with adrenaline. The lesion was resected with a clear margin of normal tissue, leaving a triangular secondary defect. The initially horizontal incision was expanded in the way allowing formation two flaps. In the next stage the skin flaps were advanced to fill the triangular skin defect. In the final stage of the procedure excess skin remaining after sliding the flaps was removed and the wound edges were closed with sutures (Figs. 2 A–D).

Case 3

An 83-year-old man with a 13 mm tumour located in the right forehead region, persisting for the past 4 years. Based on histopathological examination, the nodular form of basal cell carcinoma was diagnosed. The lesion was removed with a clear margin of normal tissue under local anaesthesia using 1% lignocaine with adrenaline. A decision was made to fill the rectangular secondary defect with two pediculated skin flaps. In the next stage the bilateral flaps were elevated and sutured together centrally. In the final stage redundant skin tissue ("dog ears") was excised and the wound edges were sutured together (Figs. 3 A–E).

DISCUSSION

Basal cell carcinoma is the most common cancer in humans. It accounts for ca. 80% of non-melanoma skin cancers [1–3]. Basal cell carcinoma is a locally malignant tumour which rarely metastasizes. It is thought that one of the main risk factors for BCC is exposure to UV radiation [4]. Differences in BCC incidence between the countries may result not only from different levels of exposure to risk factors but also differences in reportability and inclusion in cancer registries. The highest incidence is noted in Australia (> 1,000/100,000 person-years), and the lowest in some African countries (< 1/100,000 person-years) [5]. In the German state of Schleswig-Holstein the incidence of BCC is 96.2/100,000 annually in men and 95.3/100,000 annually in women [1]. By contrast, in Lithuania the incidence in 2010 was 46.0 per 100,000 population and was similar for both sexes [2]. No data are available on the incidence of basal cell carcinoma in Poland. Recent decades have seen a steady increase of BCC incidence worldwide [2]. Less than 10% of BCC

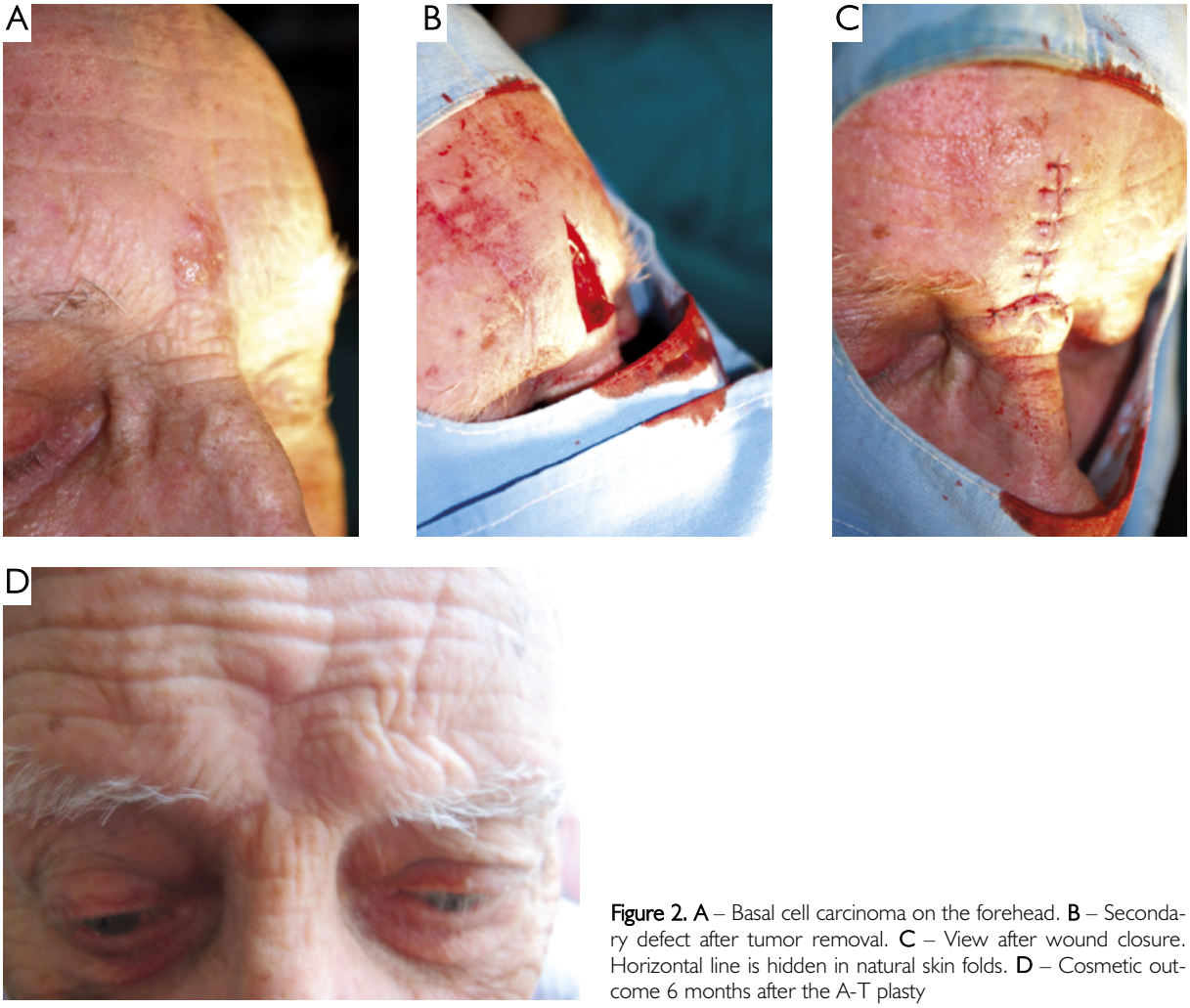

Figure 2. **A** – Basal cell carcinoma on the forehead. **B** – Secondary defect after tumor removal. **C** – View after wound closure. Horizontal line is hidden in natural skin folds. **D** – Cosmetic outcome 6 months after the A-T plasty

cases occur in patients below 50 years of age, while more than 50% – in patients older than 70 years [2]. Approximately 30–40% of BCC patients develop further tumours within 10 years [5]. Nodular BCC is the most common form of the cancer, accounting for 75–80% of all cases [4].

Most basal cell carcinomas develop on the skin of the face [1–3]. In almost half of all cases BCC occurs on the skin of the nose [3]. Taking account of similarities in skin structure and optimalization of aesthetic effects of surgical procedures, the face area can be divided up into 14 facial aesthetic units: forehead, right and left cheek, nose, right and left upper eyelid, right and left lower eyelid, right and left auricle, upper lip, lower lip, chin and neck [6, 7]. The forehead unit, which is discussed in this study, can be subdivided into the central subunit, two lateral subunits and eyebrows [7]. Ca. 13–23% of all facial BCCs are localized in the forehead region defined above [6, 8].

Although there are many treatment modalities available for basal cell carcinoma, surgical removal is considered the most effective method. Radicality of resection is of key importance for treatment. The size of resection margins depends on the risk of recurrence [9, 10]. High risk factors for BCC recurrence are listed in Table I. For low-risk BCC, with a diameter below 2 cm, the minimum resection margin is 4 mm. This allows tumour removal in 95% of cases [11]. High-risk BCC, however, require resection margins of 13–15 mm [12]. These tumours are particularly suitable for Mohs micrographic surgery [13].

Depending on the size of the lesion and the anticipated size of the secondary defect, various surgical techniques are used: from simple elliptical excision followed by direct closure of the wound, through the use of local flaps to skin healing by secondary intention and skin grafts. The main objective is to select the simplest effective method that allows the achievement of the desired cosmetic effect. In line with this rule, elliptical excision should be considered as the first choice. The method is considered the most suitable for lesions located on the forehead, with a diameter below 1 cm [14]. Excision should be planned in such a manner as to make sure that the resulting scar is oriented parallel to

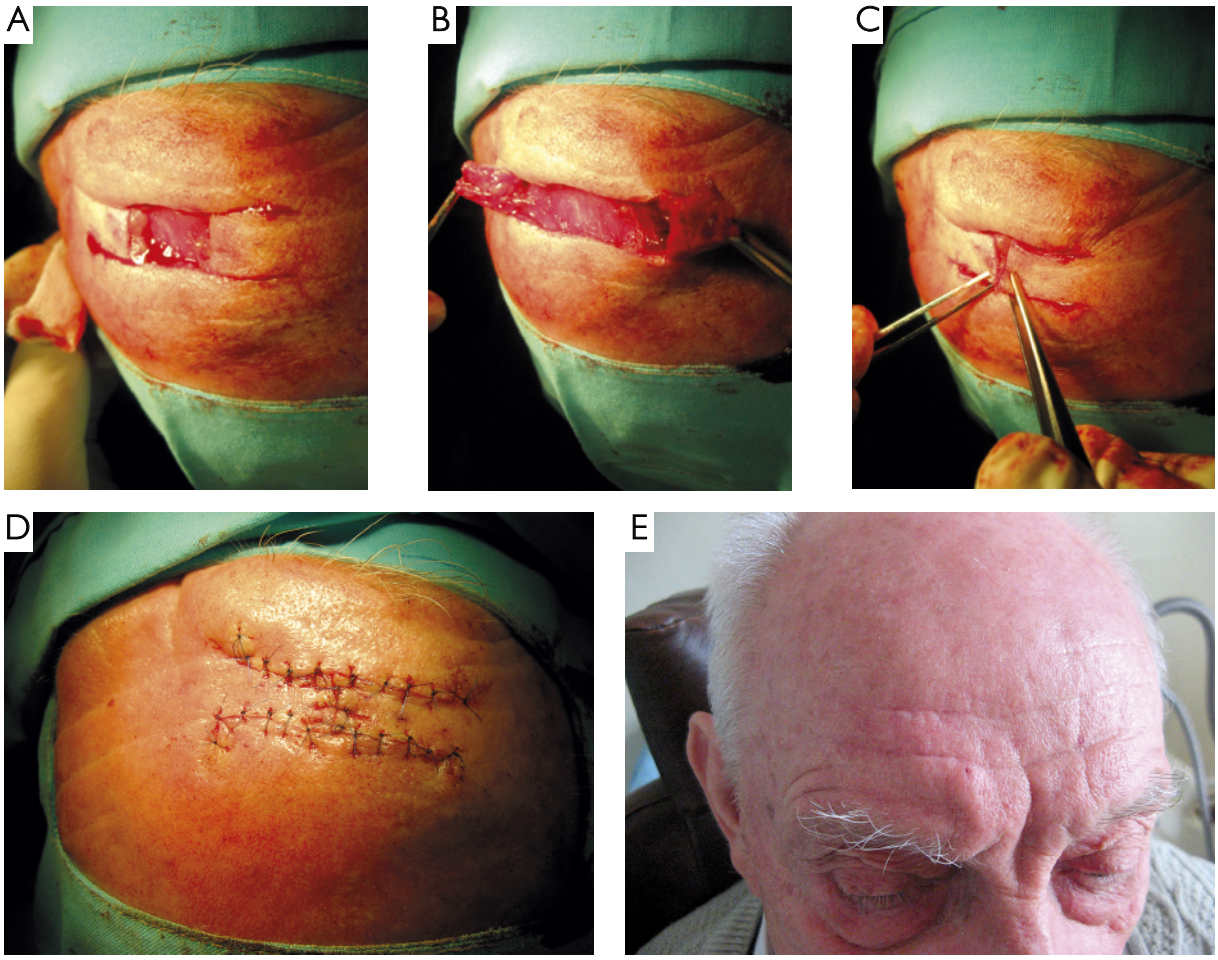

Figure 3. **A** – Rectangle secondary defect after tumor removal with margins. **B** – View after preparation of flaps. **C** – Wound edges can be approximated without tension. **D** – H-Plasty. View after wound closure. **E** – Cosmetic outcome 2 months after H-plasty

relaxed skin tension lines (RSTLs). A modification of elliptical excision is M-plasty which was applied in one of the clinical cases presented above (Figs. 1 A–C). The technique reduces the length of the excision (and, consequently, the scar) by up to one third, which is especially beneficial for lesions located at the borders between facial aesthetic units [10].

The most common local flap reconstructions performed in the forehead region include A-T plasty (also known as T-plasty) and H-plasty. The techniques were applied in the two clinical cases outlined above (Figs. 2 A–D and 3 A–E). Both of them use local sliding flaps. A major advantage of sliding flaps is the similarity of skin thickness, colour and texture. Also, as opposed to rotational flaps and transposition flaps, they do not change the orientation of wound tension [10]. The final effect of the procedure depends crucially on appropriate skin flap elevation. The movement of the flap can result in redundant skin ("dog-ears") which must be removed. H-plasty is frequently applied for the resection of lesions in the region of the eyebrow or supraorbital ridge. The resulting surgical defect is filled with two rectangular sliding flaps with a length to width ratio of 2–3 : 1 [10, 15]. The technique ensures a good cosmetic effect since the scars are less visible in the horizontal lines of the forehead. H-plasty can be used for filling defects up to 30 mm in diameter [15]. A-T plasty is a technique which allows to camouflage the horizontal scar in the hairline, in the horizontal lines of the forehead or at the border between aesthetic units of the face [10]. It is a safe method associated with good cosmetic effects. The final effect of second intetion healing in the forehead area is quite unpredictable. The

Table 1. Characteristics of high risk BCC [9, 10]

BCC size (2 cm and above; the risk of recurrence rises with increasing tumour size)
BCC location (central part of the face, area of the eyes, nose, lips and ears)
Borders of the lesion assessed clinically as poorly circumscribed
Histopathological subtypes: morpheiformis, infiltrative, metatypical
Histopathological characteristics of tumour aggressiveness: involvement of blood vessels and/or nerves
Failure of previous treatment

resulting scar can create tension of the adjacent structures, and patients may consider its appearance unsatisfactory [14]. Skin grafting is used in the forehead area when there are reasons to assume that other methods will not bring a satisfactory outcome, e.g. for covering large skin defects [14].

CONCLUSIONS

In spite of multiple treatment modalities available for basal cell carcinoma, the most effective therapy of this cancer type located in the forehead region is surgical resection. Radical tumour resection with an appropriate margin of normal tissue is a priority for treatment. Without compliance with this requirement even the best reconstructive procedure is futile.

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