Squamous cell carcinoma of the nail apparatus in the population of Northern Poland

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Abstract

Introduction: Malignant tumours of the nail apparatus in Caucasian population are rare. Among them melanoma and squamous cell carcinoma (SCC) are the most common diagnoses. Non-characteristic clinical feature of nail apparatus SCC (NSCC) may mimic various inflammatory and infectious diseases. Tumour is often misdiagnosed what causes delay of the treatment.

Aim: Investigation on frequency, clinical and histopathological characteristics of NSCC in a Northern Poland population.

Material and methods: One thousand five hundred and eighty-eight patients with various nail apparatus pathology who were referred to the Department of Dermatology, Venerology and Allergology, Medical University of Gdansk, from 2005 to 2010, were included in the study. Among all these patients 12 cases of nail apparatus maligancy were diagnosed including 4 cases of NSCC.

Results: The NSCC was observed in 0.25% of the patients with nail pathology. Tumour affected only men. Mean age came to 58.3 years old. The median delay to diagnosis was 21 months what was caused by mistaken initial diagnosis in 3 cases. The most frequent localization was the thumb of dominant hand. Relapses after surgical treatment were not observed. Follow-up lasted from 2 to 5 years.

Conclusions: The incidence of NSCC in Caucasian population is low. Tumours may mimic other benign conditions so histopathologic examination is fundamental. Wide surgical excision and micrographic surgery still seem to be the first line treatment in local invasive NSCC.

Key words: squamous cell carcinoma, nail apparatus, surgery.

Introduction

Malignant tumours of the nail apparatus in the Caucasian population are rare. Among them melanoma and squamous cell carcinoma (SCC) are the most common diagnoses. Non-characteristic clinical feature of nail apparatus SCC (NSCC) may mimic various inflammatory and infectious diseases. The tumour is often misdiagnosed what delays the treatment [1, 2].

There are only few reports about tumours within the nail apparatus; the largest series includes 35 cases. This is the first report concentrating on NSCC in the Polish population.

Aim

Our aims were to investigate the incidence and clinical presentation of the NSCC as well as to analyze the efficacy of surgical treatment of these lesions.

Material and methods

One thousand five hundred and eighty-nine patients with various nail apparatus pathology who were diagnosed and treated in the Department of Dermatology, Venereology and Allergology Medical University of Gdansk from 2005 to 2011, were included in the study. The diag-

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Table 1. Characteristics of the patients

Parameter	Patient			
	1	2	3	4
Gender	M	M	M	M
Age [years]	62	54	59	71
Phototype	II	III	II	II
Personal/familial history of skin cancer	(–)	(–)	(–)	(–)
History of trauma	(–)	+	(–)	(–)
Sun exposure	(–)	(+)	(–)	(–)
Localization	R thumb	Hand R II	R thumb	Foot R IV
Clinical feature	Tumour	Hyperkeratotic tumour	Tumour	Ulcerated tumour
Histology	SCC G2	SCC "in situ"	SCC G2	SCC G3 Verrucous carcinoma
Bone invasion	(–)	(–)	(–)	(–)
Metastases	(–)	(–)	(–)	(–)
Treatment	Wide excision	Wide excision	Wide excision	Amputation

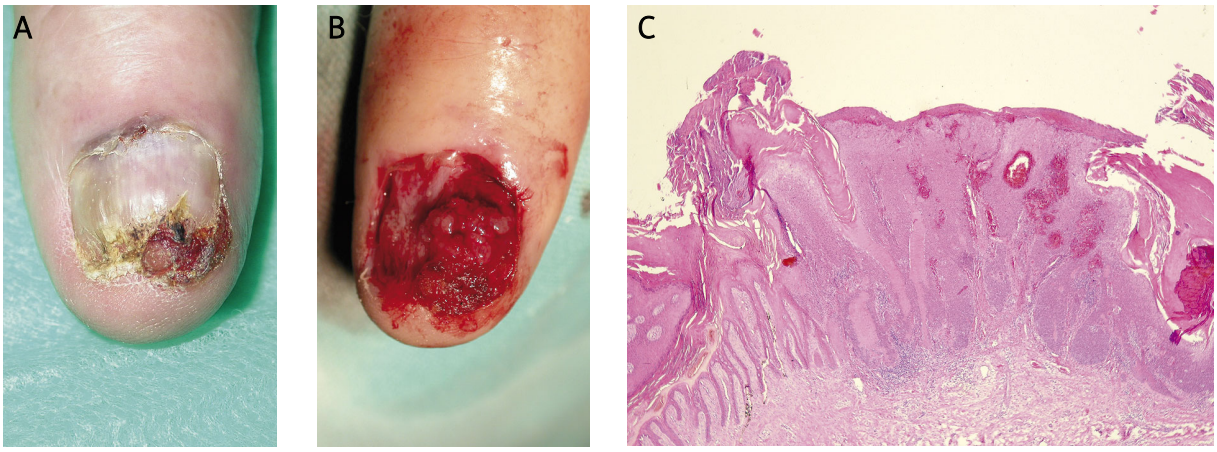

Figure 1. A, B – Invasive NSCC presenting as subungual bleeding tumour. **C** – Histological feature carcinoma planoepitheliale G2 (patient 1)

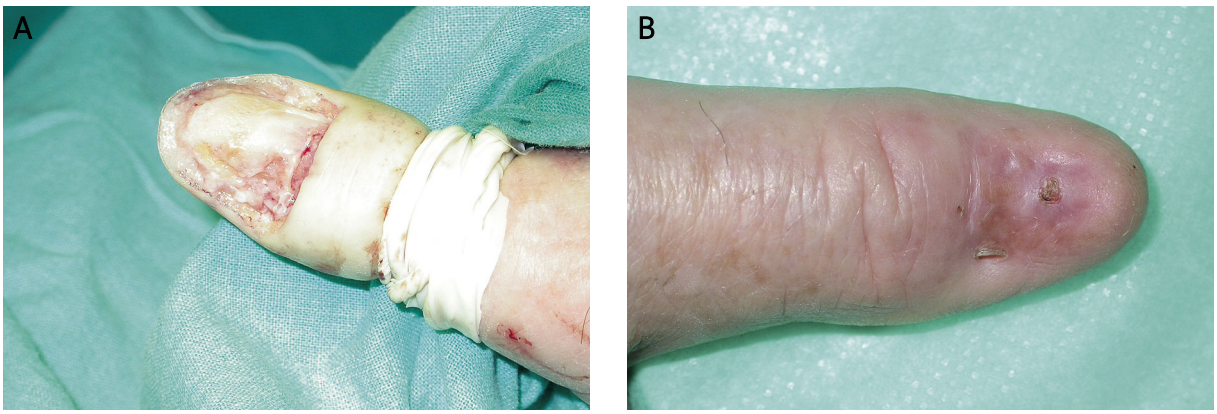

Figure 2. A – Surgical defect after a wide surgical excision. **B** – Good aesthetic result

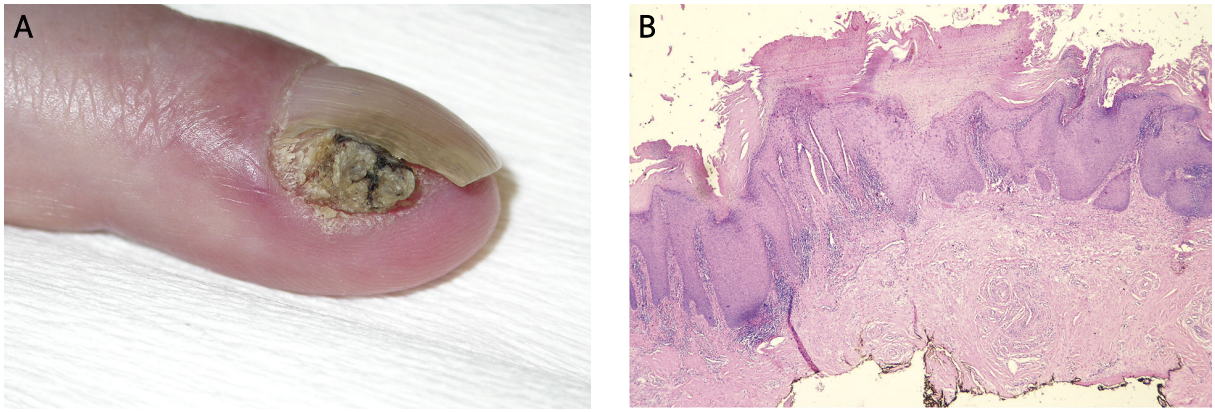

Figure 3. A – Clinical feature of NSCC "in situ". **B** – Histological feature (patient 2)

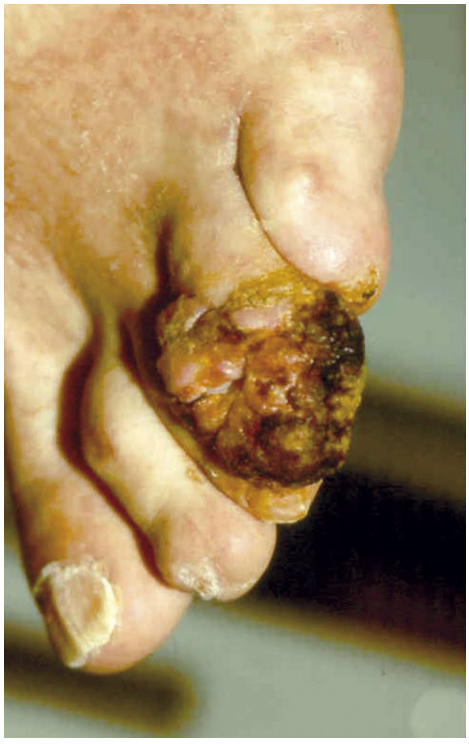

Figure 4. Clinical feature of verrucous carcinoma (patient 4)

nosis was established basing on clinical, microbiological, histological and genetic investigations. Disorders were grouped according to the following classification: 1) infectious and inflammatory disorders, 2) hereditary and congenital abnormalities, and 3) benign and malignant tumours. Tumours of the nail apparatus were observed in 129 patients (74 females and 55 males). Among all these patients, 12 cases of malignant tumours were diagnosed, including 8 cases of melanoma and 4 NSCC cases.

All these patients were treated surgically. A wide excision of the nail apparatus and skin grafting were performed in 3 cases. In one case, we amputated the distal phalanx.

Results

Malignant tumours represented about 0.75% of the nail pathology. The NSCC was observed in 0.25% of cases. The tumour affected only men. Mean age was 58.3. The median delay to diagnosis was 21 months what was caused by a mistaken initial diagnosis in 3 cases (subungual verruca or onychomycosis were diagnosed). The most frequent localization was the thumb of the dominant hand.

Relapses were not observed. Follow-up lasted from 1 to 5 years. Table 1 shows characteristics of the patients.

Discussion

Malignancies of the nail apparatus in the Caucasian population are rare [1, 3, 4]. Spencer [5] claim that NSCC is the most frequent one. Dominguez-Cherit *et al.* [6] analyzed 234 patients with nail unit tumours. Malignant melanoma ranked fourth (9.82%), and the second most frequent malignant tumour was squamous cell carcinoma (SCC; 4.70%). In our material, melanoma was observed in 8 cases and NSCC in 4 (66.7% vs. 33.4%). In our study, only 0.25% of patients with nail diseases suffer from NSCC. That observation seems to confirm rarity of this entity in our population. However, due to lack of precise reports, the real incidence is unknown.

Aetiopathogenesis of NSCC is unclear. Human papilloma virus (HPV) infection seems to be the most important factor [7]. In 1989, Moy *et al.* [8] showed, by dot blot hybridization, presence of DNA sequences homologous to HPV-16 in 60% of fingernails SCC. In 1991, Ashinoff *et al.* [9] were the first to use the polymerase chain reaction to detect HPV in formalin-fixed, paraffin-embedded specimens of periungual squamous cell carcinoma. Five of the seven lesions

contained HPV16 DNA. Various studies showed an association of nail apparatus SCC and mucosal HPV. The suggested mechanism of infections is virus transmission from the genital to digital area. In contrast to fingernails disease, the role of HPV in SCC of toenails is not proven. There is no established link between ultraviolet exposure and NSCC, either. The nail plate blocks almost all UVB and limits UVA radiation. Other possible etiologic factors include chronic inflammation, X-ray radiation and trauma [10, 11].

In our study, as in other reports, the tumour was found after the fifth decade. Our report also confirmed well-established male predominance. The NSCC, as other tumours, can be found on any nail but fingernails are most commonly affected. In Dalle *et al.* [2] study, fingernails were affected in 28 of 35 (80%) cases, while in ours – 3 of 4 (75%).

Clinical presentation depends on localization of the neoplastic process. Periungual SCC may manifest as: hyperkeratosis, fibrokeratoma-like tumour, erosion, scaling, fissuring and swelling. Subungual involvement may present as onycholysis, ulceration, subungual tumour, erythronychia, leuconychia and melanonychia. In our study, NSCC in situ presented as hyperkeratotic mass, and invasive one – as ulcerated and bleeding tumour [1].

Bone infiltration is seen in about 20% of the patients but metastases are rare (2%) [1, 7]. All of our patients presented only a local invasion of NSCC.

It seems that NSCC in situ (Bowen disease) is more aggressive in the nail tissues as it focally demonstrates histologic features of the invasive neoplasm. Both Bowen disease and invasive NSCC are difficult to differentiate clinically so a common denominator 'epidermoid carcinoma' is frequently used for both tumours [1].

Classical treatment of NSCC requires amputation of the affected digit. Over the last decades, less aggressive procedures are preferred however [7]. In less advanced cases, the treatment of choice is Mohs micrographic surgery. Goldminz and Bennett [12] reported only 2 cases of recurrence after treatment of 49 patients with micrographic surgery. Dalle *et al.* [2] performed a limited surgical excision, wide surgical excision and amputation. The relapse rate after a wide surgical excision was low (5%), but it was much higher after a limited surgical excision (56%). The risk of relapse after non-surgical procedures is relatively high comparing to surgery. In our Department, a wide surgical excision is preferred. This is characterized by good ontological, functional and aesthetic effects.

Conclusions

The incidence of NSCC in the Caucasian population is low. Tumours may mimic other benign conditions so the histopathologic examination is fundamental. A wide surgical excision and micrographic surgery still seem to be the first line treatment in local invasive NSCC.

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