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SHORT REPORT

One-stop-shop treatment for basal cell carcinoma, part of a new disease management strategy

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Abstract

Background The number of skin cancer patients, especially patients with basal cell carcinoma (BCC), is rapidly increasing. Resources available at dermato-oncology units have not increased proportionally, which affects the throughput time of patients.

Objective To assess the feasibility and safety of implementation of the one-stop-shop concept for the treatment of patients with BCC at a dermato-oncology unit.

Methods A pilot study on a one-stop-shop concept for BCC was performed to investigate procedure safety and patient satisfaction. Fresh frozen sections were used to diagnose the tumours, and subsequently treatment with photodynamic therapy or excision was performed on the same day. Time spent in the hospital was measured and questionnaires were used to evaluate patient satisfaction.

Results Sixteen patients, who together had 19 tumours, were included. Diagnoses were made within a mean time of 100 min (range 27–160 min). The mean throughput time was 4 hours and 7 min (range 60–420 min). No complications were observed, and patient satisfaction was high.

Conclusion The one-stop-shop concept for the treatment of skin cancer patients is feasible and efficient for both patients and dermato-oncology units. Further research is necessary to investigate cost-effectiveness when larger patient groups are involved.

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Conflicts of interest

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Introduction

The worldwide incidence of skin cancer has risen dramatically over the last decades.^{1,2} Resources available at hospitals have not increased proportionally, resulting in long total throughput times, the time between patients' arrival at the clinic and the end of their treatments.^{3,4} At the Catharina Hospital in Eindhoven, adjustments are being made on several levels of the dermato-oncology unit in collaboration with Eindhoven University of Technology.^{3,4} We present the results of a pilot study on the use of a one-stop-shop concept for basal cell carcinoma (BCC) treatment. One-stop-shop implies that the initial consult meeting at the outpatient clinic, diagnosis and treatment, all take place in 1 day.

Methods

Our capacity analysis showed that it seems feasible to perform a one-stop-shop treatment on days that Mohs micrographic surgery (MMS) was performed.⁵ On these days, two appointment slots for surgical excision and three for PDT needed to be reserved.

We included 16 patients with (according to the dermatologist) clinically suspect, well-defined, superficial or nodular BCC. The one-stop-shop concept was offered to patients when they arrived at the hospital. Patients had to be older than 18 years, without any serious comorbidity. Patients were excluded in case of pregnancy, breastfeeding, holiday or sports on the short term. Patients were

also excluded in case of an MMS indication, like an aggressive BCC growth pattern or high-risk location in the face.

Patients seen at the outpatient clinic before 11.00 AM were eligible to participate (with a maximum of five patients per day), which would leave enough time to diagnose and treat the lesion on the same day. A resident took a 4 mm punch biopsy and immediately afterwards, a technician made fresh frozen sections (carried out vertically). Part of the biopsy was used for examination on paraffin. Both the Mohs surgeon (a dermatologist) and a pathologist examined the fresh frozen sections. The time between the biopsy and the histopathological diagnosis was recorded. At a later moment, the pathologist examined the paraffin slides.

The resident discussed the diagnosis and appropriate treatment with the patient, and also provided additional information about sun protection and follow-up. The suggested treatment could be topical imiquimod 5% cream, photodynamic therapy or standard excision, which were performed on the same day.

Questionnaires (answered at the intake and after treatment) were used to evaluate patient satisfaction about the one-stop-shop principle. The questionnaires included questions like; would you prefer to have the diagnosis and treatment on the same day? What do you think about the waiting time? Did you receive enough information about skin cancer and the treatment?

Results

Patients arrived at the clinic between 9.00 and 11.15 AM. Nineteen tumours, localized on the back, limbs and face, were included. Three patients had two lesions (Table 1). Mean time between arrival and diagnosis was 100 min (Table 2). Clinical diagnosis corresponded with the histopathological diagnosis for 13 of the 19 tumours.

In all but one biopsy, the pathologist confirmed the diagnosis of the Mohs surgeon. There was one inconsistent outcome (Table 2), concerning the diagnosis of an epidermal cyst in combination with a malignancy.

Three superficial BCCs in three patients were treated with PDT, 14 tumours in 13 patients were excised, all on the day of the diagnosis. One lesion, a squamous cell carcinoma, was treated with a slow MMS procedure. This procedure equals MMS regarding the mapping of the tumour. In a slow MMS procedure, however, paraffin slides are used instead of fresh frozen sections.⁶ In our hospital, results of these paraffin slides become available after 4–5 days. The mean throughput time was 4 h and 7 min. (Table 2).

All patients were highly satisfied with the one-stop-shop concept. Positive reactions were: good to know the diagnosis immediately and that the tumour is treated at once, less appointments, accompanying persons need to schedule only 1 day and less working days are lost.

Patients reported the wish to have known about the possibility of the one-stop-shop concept beforehand, to be prepared practically and mentally. Afterwards, all patients reported that they would prefer the one-stop-shop treatment again. They mentioned

Table 1 Baseline characteristics

Patient	Age years (mean 67)	Clinical diagnosis	Localization	Size (cm)
1	85	sBCC	Back	1.5 × 0.5
2	65	nBCC	Back	1 × 0.5
3	71	sBCC	Scapula	1 × 1
		nBCC	Back	2 × 2.5
4	85	nBCC	Back	0.7 × 0.8
5	61	nBCC	Chest	0.7 × 0.5
6	44	sBCC	Shoulder	1 × 1
		sBCC	Back	0.8 × 0.8
7	73	sBCC	Temporal	0.5 × 0.5
8	81	nBCC	Arm	NA
		nBCC	Cheek	NA
9	47	sBCC	Temporal	1 × 1
10	68	nBCC	Temporal	1 × 0.5
11	86	nBCC	Cheek	0.9 × 0.9
12	39	nBCC	Back	1 × 1
13	63	nBCC	Jaw	0.4 × 0.4
14	79	sBCC	Leg	0.6 × 0.5
15	62	nBCC	Nose	0.6 × 0.5
16	60	nBCC	Chest	NA

sBCC, superficial BCC; nBCC, nodular BCC; NA, not available.

that it would also be acceptable to be treated within the following week.

Discussion

One-stop-shop is a trendy subject nowadays. Many companies and several medical specialties are creating one-stop-shop concepts.^{7–9}

As early as 1999, Tagge *et al.* described a one-stop surgery approach for minor surgical paediatric procedures. They concluded that a variety of outpatient surgical procedures can be handled using a one-stop surgery method.¹⁰ In dermatology, almost all surgical procedures are performed under local anaesthesia, which makes them suitable for a one-stop-shop approach. No additional screening by an anaesthesiologist is necessary, and there are no post-operative complications due to general anaesthesia.

By reducing the throughput time, the administrative workload and therefore costs will be decreased. Moreover, when fewer steps in the process must be taken, there is less risk of errors. Reducing throughput time is generally considered an important aspect of patient satisfaction, as this is a period of uncertainty for a patient.^{9,11,12}

Our mean throughput time was 4 h and 7 min. Photodynamic therapy caused the highest throughput time, 420 min. The actual treatment time of a surgical excision is significantly shorter, with an average of 30–45 min. The treatments of patients 13 and 15 were performed the next day due to a shortage of operation rooms and personnel.

Due to the protocol and extra safety checks, the Mohs surgeon and a pathologist examined the fresh frozen sections. Time to

Table 2 Tumour characteristics

Patient	Time biopsy-diagnosis on FS by Mohs surgeon (min) Mean 68 min	Time arrival-definitive diagnosis on FS (min) Mean 100 min	Time arrival-end treatment (min) Mean 247 min	FS Mohs surgeon	FS pathologist	Paraffin pathologist	Treatment
1	NA	160	NA	sBCC	sBCC	sBCC	PDT
2	NA	NA	NA	nBCC	nBCC	nBCC	SE
3	NA	84	NA	sBCC	sBCC	sBCC	SE
4	NA	84	NA	Infiltr BCC	Infiltr BCC	Infiltr BCC	SE
5	NA	27	60	nBCC	nBCC	nBCC/infiltr	SE
6	NA	120	147	nBCC	nBCC	nBCC	SE
7	NA	135	420	sBCC	sBCC	sBCC	PDT
8	NA	105	165	nBCC/infiltr	nBCC/infiltr	nBCC/infiltr	SE
9	36	119	375	nBCC	nBCC	nBCC	SE
10	110	115	345	sBCC/infiltr	sBCC/infiltr	No residual BCC	SE
11	115	120	350	Epidermal cyst + BCC	Epidermal cyst	Epidermal cyst + SCC	SE
12	NA	NA	NA	sBCC	sBCC	sBCC	PDT
13	27	75	165	nBCC	nBCC	nBCC	SE
14	75	131	225	nBCC/micronodular	nBCC/micronodular	nBCC/micronodular	SE
15	50	125	327	nBCC	nBCC/sBCC	nBCC	SE
16	90	95	Next day	nBCC	nBCC	nBCC	SE
17	NA	45	NA	M Bowen	M Bowen	M Bowen	SE
18	NA	65	Next day	SCC	SCC	No residual SCC	Slow MMS
19	40	90	140	nBCC	nBCC	nBCC	SE

FS, frozen section; sBCC, superficial BCC; nBCC, nodular BCC; Infiltr, infiltrative; SE, standard excision; NA, not available; PDT, photodynamic therapy; MMS, Mohs micrographic surgery.

diagnosis can be reduced when the fresh frozen biopsy is examined only by the Mohs surgeon, and treatment follows immediately thereafter. The pathologist can check the slides at a later moment.

Mohs micrographic surgery is performed by specially trained dermatologists. From literature, it is apparent that interpretations of fresh frozen BCC sections by Mohs surgeons are of an excellent quality. In 98.9% there is total agreement in interpretation among Mohs surgeons and pathologists.¹³ In our study, there was one inconsistent outcome, involving an epidermoid cyst in combination with a malignancy. After a careful re-examination with the pathologist, we concluded that the fresh frozen sections did not show signs of a basal cell or squamous cell carcinoma. The paraffin slide showed an epidermoid cyst with some irregularity at the border, suspect for a squamous cell carcinoma. This case shows that fresh frozen sections are more difficult to interpret for lesions other than BCCs. In case of doubt, an extra paraffin slide can be examined. Diagnosis on paraffin slides could take less than 4–5 days, as technically this procedure could be performed within 24 h.

One could consider performing immediate treatment based on the clinical diagnosis. This will reduce throughput time even more and therefore will be more cost-effective. A fresh frozen biopsy could be reserved for doubtful cases, larger tumours and tumours in the head/neck area. A biopsy provides the BCC subtype, which influences the treatment modality and excision margin. In our study, two clinically superficial BCC lesions turned out to be nodular BCC; the choice of treatment based on histopathology was surgical excision. For another two lesions, which turned out to be of an aggressive subtype, the surgical excision margin was increased from 3 to 5 mm. In patient number 15, histopathology showed a squamous cell carcinoma. Therefore, a slow-Mohs procedure was performed.

There could be some legal aspects related to the one-stop-shop principle. In The Netherlands, the law prescribes that a physician is obliged to give a patient time to think about the proposed treatment. It is not specified, however, how much time this should be.¹⁴ Lesions suspect for melanoma or squamous cell carcinoma are in many cases, for medical reasons, excised at the first visit. One could consider using the one-stop-shop principle especially for patients who are already familiar with skin cancer and the available types of treatment.

Special attention needs to be given to the reimbursement of this concept. In various countries, insurance companies do not reward treatment when it is performed on the same day as the diagnosis. Further research will be necessary to investigate the cost-effectiveness regarding the one-stop-shop process.

Conclusion

In our experience, diagnosing and treating patients on the same day is safe. We did not see any treatment-related complications.

With the use of fresh frozen sections, diagnosis can be made on the same day. The interpretation of the histology slides can be made only by the Mohs surgeon or together with a pathologist. Patients are satisfied with the fast diagnosis and treatment. Further research will be necessary to extend the principle and to examine cost-effectiveness.

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