Pulmonary metastases from basal-cell carcinoma of skin

ALEX SAKULA

From Redhill General Hospital, Surrey, UK

Sakula, A. (1977). Thorax, 32, 637–642. Pulmonary metastases from basal-cell carcinoma of skin. Although rodent ulcers are a relatively common malignant condition of the skin, pulmonary metastases arising from them are extremely rare. There have so far been only 29 authenticated reports of this condition.

A further case is described of a man who, at the age of 35, developed a rodent ulcer (typical basal-cell carcinoma) on the forehead. Despite local excisions, skin grafting, and radiotherapy, the ulcer continued to recur, although there was no spread to regional lymph nodes. When he was aged 52, he developed widespread bilateral pulmonary lesions and a right pleural effusion. Thoracotomy provided a lung biopsy which showed the typical histological appearance of basal-cell carcinoma. He died aged 54, 19 years after the onset of the rodent ulcer, and necropsy confirmed that the pulmonary lesions were bloodborne metastases of basal-cell carcinoma.

Rodent ulcers are the commonest form of malignant disease of the skin. Whereas squamous-cell carcinoma of the skin characteristically spreads to regional lymph nodes, rodent ulcers of the skin (basal-cell carcinoma) were, until recent times, considered to be an entirely localised form of skin malignancy showing no tendency to distant metastasis (MacLeod and Muende, 1940; Walther, 1941; Ingram and Brain, 1957; Belisario, 1959).

However, as far back as 1894, Beadles had reported the case of a 56-year-old man with a rodent ulcer of the right lower eyelid with spread to regional lymph nodes. Most dermatologists and pathologists now accept that basal-cell carcinoma may occasionally metastasise to regional lymph nodes, and 90 such cases have been reported (Willis, 1960; Lever, 1967; Hughes, 1973). The first report of widespread bloodborne metastases from basal-cell carcinoma was by Spies (1930), and it is now generally accepted that pulmonary metastases may occasionally occur (Spencer, 1968).

In this paper the 29 previously reported authenticated cases of pulmonary metastases from basal-cell carcinoma are reviewed, and a further case is presented (Table).

Case report

The patient, a pharmaceutical chemist, was aged 52 when first seen in November 1974.

HISTORY OF RODENT ULCER

In 1957, when he was aged 35, a small scar resulted from minor trauma on the forehead. In 1958, the scar was penetrated accidentally by a rose thorn, became inflamed, and failed to heal, and a small ulcer resulted (Fig. 1). Biopsy showed this to be a basal-cell carcinoma with some differentiation of adenoid type, infiltrating diffusely and deeply (Fig. 2). The ulcer was completely excised and covered by a small rotating flap of skin.

Three years later, in 1961, there was a painful recurrence of the ulcer, and biopsy showed small islands of basal-cell carcinoma infiltrating deeply and extensively. The ulcer was again excised and covered by a larger skin flap from the scalp. After another eight years, in 1969, the rodent ulcer recurred yet again (Fig. 3). A painful lump also appeared above the right temporomandibular joint, and exploration showed that this was not a spread to the local lymph node, but the lesion was in the skin, extending down to the cartilage of the external auditory meatus and towards the temporal mandibular joint. Biopsy of this showed the same appearance of basal-cell carcinoma. He received two courses of radiotherapy to this lump as well as to the ulcer on the forehead. In 1972, there was a further recurrence of the ulcer, which required partial excision.

PULMONARY COMPLICATIONS

He had not suffered from any previous significant
pleuritic pain, and a chest radiograph showed increased bilateral opacities with a right pleural effusion (Fig. 4). Aspiration of the latter produced a bloodstained pleural fluid, but cytology and pleural biopsy did not show evidence of malignancy. The tuberculin test was negative, and sputum bacteriology for Mycobacterium tuberculosis was also negative. A further bronchoscopy again revealed a normal appearance.

In August 1975 a right thoracotomy was performed. The pleura was widely covered with nodular plaques, and some were adherent to the underlying ribs. A similar plaque was seen in the pleura over the diaphragm. The lung was studded with numerous nodules. No lymph nodes were palpable at the hilum or elsewhere. The histology of these plaques and nodules showed a small-cell carcinoma which looked identical with the histology of the original rodent ulcer (Fig. 5).

He was treated by a course of methotrexate, 200 mg intravenously every three weeks. After five injections there was no clinical or radiological improvement. His condition continued to deteriorate and he suddenly collapsed and died in September 1976 at the age of 54. This was two years after the first appearance of the pulmonary lesions and 19 years since the original development of the ulcer on the forehead.

---

**Table Analysis of reported cases of pulmonary metastases secondary to basal-cell carcinoma**

<table>
<thead>
<tr>
<th>Author</th>
<th>Sex</th>
<th>Age at onset of rodent ulcer</th>
<th>Site of rodent ulcer</th>
<th>Duration (years)</th>
<th>Regional lymph nodes involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spies (1930)</td>
<td>M</td>
<td>58</td>
<td>Face</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>de Navasquez (1941)</td>
<td>F</td>
<td>40</td>
<td>Face</td>
<td>6</td>
<td>-</td>
</tr>
<tr>
<td>Small and Hankins (1949)</td>
<td>M</td>
<td>30</td>
<td>Ear</td>
<td>8</td>
<td>+</td>
</tr>
<tr>
<td>Lattes and Kessler (1951)</td>
<td>M</td>
<td>37</td>
<td>Wrist</td>
<td>22</td>
<td>+</td>
</tr>
<tr>
<td>Hunt (1952)</td>
<td>F</td>
<td>61</td>
<td>Scalp</td>
<td>12</td>
<td>+</td>
</tr>
<tr>
<td>Huntington and Levan (1957)</td>
<td>M</td>
<td>43</td>
<td>Face</td>
<td>23</td>
<td>-</td>
</tr>
<tr>
<td>Richter (1957)</td>
<td>M</td>
<td>71</td>
<td>Scrotum</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>Pickren and Katz (1958)</td>
<td>M</td>
<td>26</td>
<td>Face</td>
<td>19</td>
<td>-</td>
</tr>
<tr>
<td>Cotran (1961)</td>
<td>F</td>
<td>51</td>
<td>Face</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>Crawford and Joslin (1964)</td>
<td>M</td>
<td>61</td>
<td>Scalp</td>
<td>9</td>
<td>+</td>
</tr>
<tr>
<td>Meadows (1964)</td>
<td>M</td>
<td>60</td>
<td>Leg</td>
<td>1</td>
<td>+</td>
</tr>
<tr>
<td>Stell et al. (1966)</td>
<td>M</td>
<td>34</td>
<td>Face</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Baxter and Pirozynski (1967)</td>
<td>M</td>
<td>18</td>
<td>Face</td>
<td>26</td>
<td>-</td>
</tr>
<tr>
<td>Lakshimipati and Hunt (1967)</td>
<td>M</td>
<td>62</td>
<td>Scalp</td>
<td>13</td>
<td>-</td>
</tr>
<tr>
<td>Stewart and Ross (1968)</td>
<td>M</td>
<td>34</td>
<td>Face</td>
<td>1</td>
<td>+</td>
</tr>
<tr>
<td>Hall et al. (1970)</td>
<td>M</td>
<td>49</td>
<td>Face</td>
<td>18</td>
<td>+</td>
</tr>
<tr>
<td>Wermuth and Fajardo (1970)</td>
<td>M</td>
<td>72</td>
<td>Face</td>
<td>3</td>
<td>+</td>
</tr>
<tr>
<td>Mantell and Almeida (1972)</td>
<td>F</td>
<td>34</td>
<td>Face</td>
<td>27</td>
<td>-</td>
</tr>
<tr>
<td>Hughes (1973)</td>
<td>M</td>
<td>22</td>
<td>Face</td>
<td>2</td>
<td>+</td>
</tr>
<tr>
<td>Jackson and Adams (1973)</td>
<td>M</td>
<td>47</td>
<td>Scrotum</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Sanderson and Batten (1975)</td>
<td>F</td>
<td>57</td>
<td>Scalp</td>
<td>32</td>
<td>-</td>
</tr>
<tr>
<td>Present study</td>
<td>M</td>
<td>35</td>
<td>Scalp</td>
<td>19</td>
<td>-</td>
</tr>
</tbody>
</table>

---

Fig. 1 Rodent ulcer of forehead 1958.
Pulmonary metastases from basal-cell carcinoma of skin

Fig. 2 Biopsy specimen of rodent ulcer 1958 (H and E ×295).

Fig. 3 Rodent ulcer of forehead, recurrence 1968.

Necropsy
The larynx was normal. The right pleura showed tough fibrous adhesions over the lower lobe, and several small tumour masses were present in the right lung. The left pleura also showed fibrous pleural plaques and there was a small tumour mass in the left upper lobe. The appearance was unlike that of a primary bronchial carcinoma. The heart did not show a myocardial infarct, there was moderate atheroma of the right coronary artery, and there was a small tumour deposit adjacent to the upper half of the anterior descending branch of the left coronary artery, half encircling it. There were no other metastases. Histology of these pleural and pulmonary lesions was identical with the histology of the original basal-cell carcinoma.

Discussion
As stated above, pulmonary metastases from basal-cell carcinoma are very rare. Cotran (1961) analysed 9050 cases seen at the Memorial Hospital, New York during the period 1946–60 and found only nine cases of metastases, that is, an incidence of 0.1%, and of these only two showed pulmonary involvement. The same incidence was reported by Lakshmipathi and Hunt (1967) in Nottingham where one case of pulmonary metastasis occurred among 874 rodent ulcers. Including the patient described here, there have been 30 case reports of pulmonary metastases from basal-cell carcinoma. Of these, 22 were male and eight were female. The age at which the rodent ulcer first appeared ranged from 18 to 72 years, but there was a greater number below the age of 40 than is usual with rodent ulcer. The rodent ulcer was situated on the head in most cases, although two were on the scrotum, one on the shoulder, one on the wrist, and one on the leg. Many of the cases showed widespread involvement...
Fig. 4 Chest radiograph (PA) 1975. Multiple lung deposits and right pleural effusion.

Fig. 5 Biopsy specimen of lung nodule removed at thoracotomy August 1975 (H and E ×295).
of viscera and bones, in addition to the pulmonary lesions, but regional lymph nodes were involved in only nine. The duration of the illness (from first appearance of the rodent ulcer to the development of pulmonary metastases) was occasionally short, but there were five cases where the interval was more than 20 years (and these included two cases of more than 30 years). With the exception of the patient described by Sanderson and Batten (1975), all cases were invariably fatal.

Both rodent ulcers of skin and lung cancer (primary or secondary) are common tumours and may occur together in the same patient. The criteria for accepting the diagnosis of pulmonary metastases from basal-cell carcinoma therefore need to be stringent:

1. The primary lesion must be a basal-cell carcinoma and not squamous.
2. The primary lesion must arise from skin and not from mucous membrane or salivary gland.
3. The histology of the pulmonary lesion must be identical with that of the primary skin lesion.

The character of the pulmonary lesions varies. There may be a solitary nodule or widespread deposits in one or both lungs. The parietal pleura may be involved, and this may include the underlying ribs. Pleural effusions may develop and may be bloodstained, and diagnosis by cytology or pleural biopsy may be successful (Hughes, 1973). Spontaneous pneumothorax has been described in one case ( Cotran, 1961).

It is difficult to forecast which case of basal-cell carcinoma will develop a tendency to metastasise to the lungs. Ominous features are:

1. younger age than usual (below 40–50 years);
2. skin lesions showing a deeper invasion than usual;
3. response to therapy (excision, radiotherapy, etc.) not successful, especially if there are more than two recurrences;
4. course of the illness prolonged, often to 20–30 years (in contrast to squamous-cell carcinoma, in which metastases occur sooner).

In the presence of established pulmonary metastases the prognosis is always virtually hopeless. Of the 30 cases reported here, all (with the exception of one) were fatal, death occurring about one year from the diagnosis of pulmonary metastases.

I thank the following for their help and cooperation: Mr. T. D. Cochrane (plastic surgeon) and Dr. P. J. Stevens (pathologist), Queen Victoria Hospital, East Grinstead; Mr. R. Rowlandson (thoracic surgeon), Milford Chest Hospital; Dr. A. Folkes (radiotherapist) and Dr. N. M. Gibbs (pathologist), St. Luke's Hospital, Guilford; and Drs. T. A. J. Wickham and H. G. Penman (pathologists), Crawley Hospital.

References


Requests for reprints to: Dr. A. Sakula, Redhill General Hospital, Redhill, Surrey RH1 6LA, UK.