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TAPE-STRIPPING METHOD FOR CYTOLOGICAL DIAGNOSIS OF MYCOSIS FUNGOIDES*

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In spite of repeated skin biopsies over a number of years the diagnosis of mycosis fungoides may be difficult or impossible to ascertain by histologic methods. This applies especially to mycosis fungoides in the premycotic or plaque stage. Biopsy specimens of erythematous lesions and plaques in patients with mycosis fungoides show a dense superficial infiltrate of cells in the corium and massive invasion of the epithelium. The cells often lie in small clusters in cavities in the epithelium (Pautrier abscesses) (Fig. 1). In some cases the infiltrate is of neoplastic appearance and consists largely of immature cells, often in mitosis, and giant cells. In such cases the histological diagnosis offers no difficulties. In other cases the infiltrate is of non-specific, inflammatory character, sometimes including atypical histiocyte-like cells. It may be difficult or impossible to recognize the exact nature of these cells due to shrinkage of the specimen during fixation, dehydration and embedding. Wet fixation of smears from the skin lesions may offer better possibilities for analysing the cells, especially as regards the configuration of the nuclei, the size of the nucleoli and the distribution of the chromatin.

The cytological methods so far used in the diagnosis of skin lesions are: (a) Touch smears and imprints from biopsy specimens (1, 3). (b) Imprints from ulcerating tumours. (c) Scraping of superficial tumours (squamous cell carcinoma and basal cell epithelioma) and smears of the material (4). (d) Fine-needle puncture and smears from aspirated material from subcutaneous lesions and tumours (5, 7).

The superficial position of the invading cells in the epidermis in mycosis fungoides suggested the possibility to collect them by stripping with adhesive tape. Stripping was first used on normal skin by Wolf (8) to study the cellular structure of the horny layer and later by Szakall (6) in the investigation of the effect of detergents on the skin and by Fregert (1959) (2) in the estimation of the silicone content of different parts of the epidermis. These investigations showed that only the horny layer is stripped from normal skin.

The erythematous, slightly infiltrated lesions or plaques in mycosis fungoides are covered by an oedematous, loose epidermis. It was therefore thought that it might be possible to strip off the outer epithelial layers in a relatively large affected area by taping and then prepare imprint smears of the intra-epidermal cellular infiltrates.

Material and Methods

The tape method was tried on four patients with clinically diagnosed mycosis fungoides. Histological examination had confirmed

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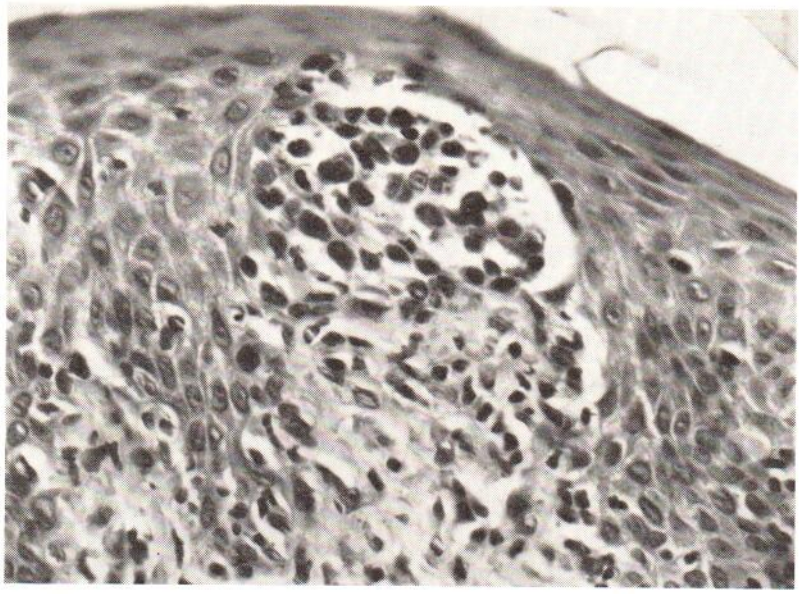

Fig. 1. Pautrier abscess in the epidermis. Haematoxylin-Eosin ×400.

the diagnosis in three of them and a probable diagnosis of malignant lymphoma in the fourth. In each patient the outer epithelial layer was stripped from slightly infiltrated erythematous lesions or plaques covered by a macroscopically intact epidermis.

Ordinary commercial Scotch tape® was used. A piece about 3 cm long was pressed against the area to be sampled and stripped off. This was repeated—some 20 to 70 times—over the same area, each time with a new piece of tape, until punctate oozing appeared. Such oozing was necessary in order to obtain smears. Lesions covered by thick psoriatic scales needed the greatest number of tapings.

A slide was firmly held against the oozing skin for a period, varying from 5 seconds to 4 minutes. The slide was then placed immediately in a vessel containing 96 % alcohol, after which the smear was fixed for at least half an hour and stained with Mayer's haematoxylin and eosin.

Since the cellular infiltrate in mycosis fungoides is situated at different levels in the epithelium, smears were prepared several times during the taping. For example, when oozing began after the skin had been taped 20 times, smears were taken then and again after the tape had been applied a further 10, 20 and 30 times.

In order to find out whether the method produced material suitable for cytochemical examination, the smear was in one case stained for acid phosphatase and lactic acid dehydrogenase (LDH). These smears were dried in air for 5 minutes but not fixed.

In addition, fine-needle puncture and aspiration (outer diameter of the needle was 0.6 mm) were done in one case. In another careful scraping with a sharp-edge instrument—as in the skin window technique—was performed.

Results

Smears showing numerous well preserved cells were obtained in all cases. The best smears were obtained when the slide was pressed against the oozing surface for 5–30 seconds. The slide had to be transferred immediately to alcohol to prevent drying artefacts.

Three of the cases studied showed a variegated picture of polymorphous, very atypical reticulum cells suggesting a definite diagnosis of malignancy (Figs 2 B, C, D). In one of these cases the biopsy had only given a provisional diagnosis of malignant disease. In the fourth case the smears

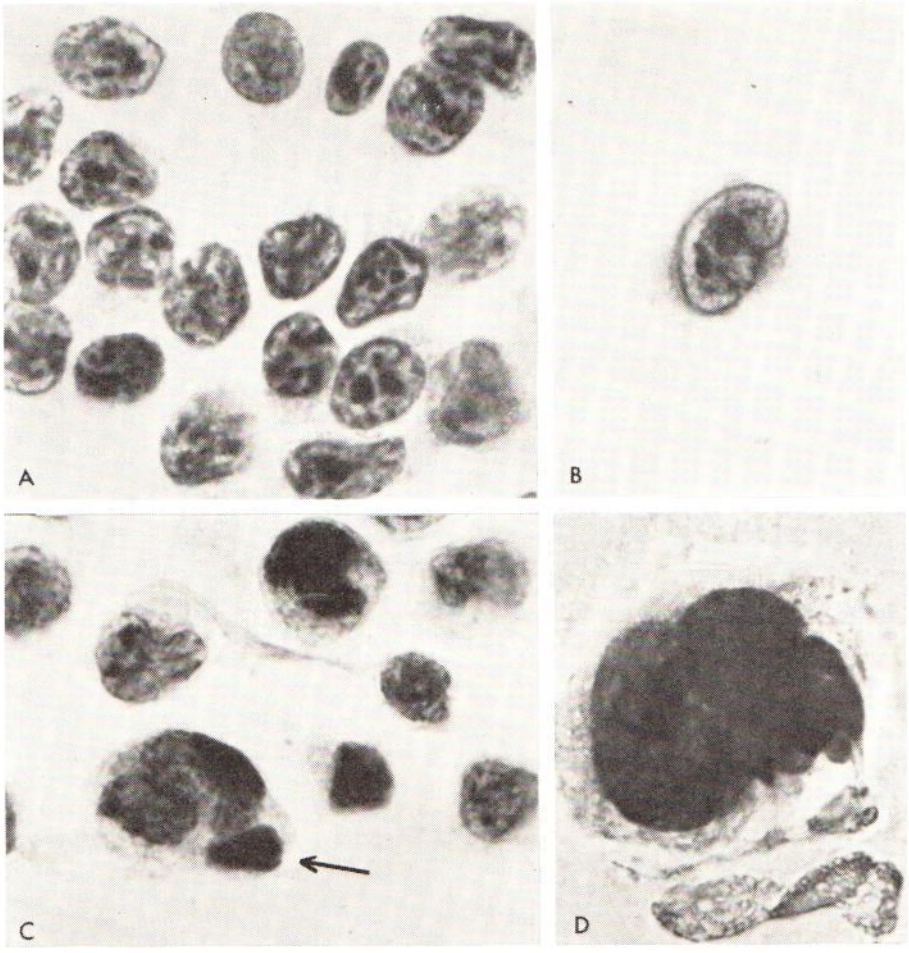

Fig. 2 A–D. A. Monomorphous immature cells with irregular, patchy chromatin pattern.—B. Atypical reticulum cell with lobulated nucleus and abnormal nucleoli.—C. Atypical reticulum cells and tumour giant cells with phagocytized material (arrow).—D. Tumour giant cell of Reed-Sternberg Type. Haematoxylin-Eosin ×1000.

showed a markedly monomorphous cell population, consisting of immature, reticulum cell-like cells (Fig. 2 A). A more detailed cytological and clinical analysis of the cases will be included in a later study of mycosis fungoides.

Smears stained for acid phosphatase and lactic acid dehydrogenase (LDH) showed a distinct staining without diffusion artefacts (Figs 3 A and B).

The material obtained by fine needle puncture was too scanty and contained mainly blood cells. The scraping material showed a large admixture of epithelial cells and blood, making it unsuitable for analysis.

Discussion

Histological examination of skin biopsies will not always permit a definite diagnosis of mycosis fungoides. Not only in early cases but also in patients where the disease clinically appears to be advanced, the decision whether the infiltrate is of inflammatory or neoplastic nature, may be difficult. While the histological examination of paraffin sections may show the extent of the infiltrate, smears allow a better estimation of the morphological details of the individual cells, and especially of their nuclei.

So far, cytological examination of skin diseases has not been widely used, partly

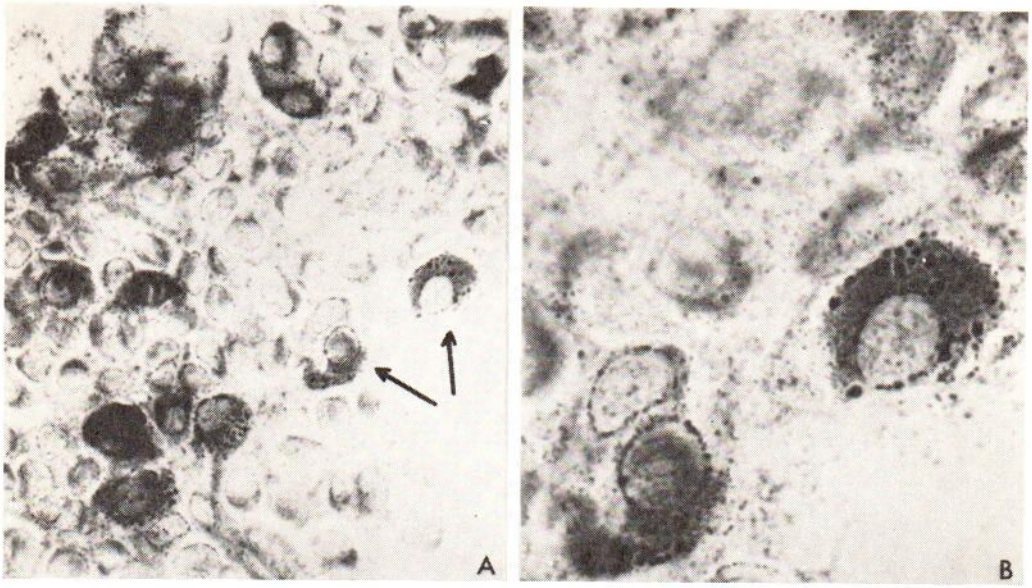

Fig. 3 A–B. A. Clusters of cells with LDH-positive granules in cytoplasm, often adjacent to nuclear membranes. Same case as in Fig. 2 A. Nitro-B.T. ×400.—B. Greater magnification of details in Fig. 3 A. ×1000.

because of the difficulty in obtaining sufficient and well preserved cellular material from non-ulcerating lesions. The tape method described above is simple and yields both numerous and well preserved cells.

It is probable that the cytological method can confirm the diagnosis of mycosis fungoides in a number of cases, where the histologic examination has only aroused a suspicion of malignancy. This is illustrated by one of our cases.

In addition, systematic cytological examination of smears from patients with mycosis fungoides may also show whether the skin lesions have a characteristic cell picture or not.

SUMMARY

A method is described for cytological diagnosis of mycosis fungoides. According to this method adhesive tape is repeatedly applied to and stripped off the skin lesions until oozing appears. Smears are then obtained by firmly pressing a microscopic slide against the moist oozing surface. The smears contain well preserved cells allowing a detailed cytological and cytochemical analysis.

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