Clinical study

CYTODIAGNOSIS OF MALIGNANT MELANOMA IN A CLINICALLY ATYPICAL LESION

B.v.Gizycki-Nienhaus, M.Volkenandt and B.Konz

ABSTRACT

Cytomorphological assessment of skin lesions, especially of malignant skin tumors, is a valuable diagnostic tool in various clinical situations. Specimens can be obtained without any pain for the patient and, when using a "quick stain method", cytomorphological examination is possible within minutes. Malignant melanomas are characterized by a typical cytomorphology with numerous large cells with regular round and sharply defined nuclei and abundant pale staining cytoplasm. The clinical case of a 53-year-old patient with an atypical lesion in his axilla, which was diagnosed as malignant melanoma by cytomorphology, is presented. Further, indications as well as limitations of cytodiagnosis are briefly discussed.

KEY WORDS

Malignant melanoma, cytodiagnosis, atypical lesion

INTRODUCTION:

In several areas of clinical medicine the cytomorphological assessment of various lesions has long been established as a useful diagnostic tool. For example, in gynaecology, since the pioneering work of Papanicolaou (1), cyto-smears are assessed routinely. In dermatology, the value of cytodiagnosis of skin lesions is widely underestimated. This is surprising, not only because characteristic cytomorphological features of various skin tumors can be defined (2-5), but also because the skin is the most accessible organ of man and therefore constitutes a nearly ideal target for cytodiagnoses.

We here report the rapid diagnosis of a clinically atypical malignant melanoma by cytomorphology.

CLINICAL PRESENTATION:

A 53-year old male patient presented with a 2,5 x 1,5 cm large pedunculated, mostly skin colored, soft nodule in his left axilla (Fig. 1). At the upper portion of the lesion a small

This case, in part, has been presented at the meeting of the "Münchener Dermatologische Gesellschaft e.V.", Munich November 1992.

hyperpigmented area was visible. The nodule was partially moist and associated with a purulent exudate. The patient reported that he had observed a very small erythematous papule in his left axilla during recent years. The present lesion, however, had evolved rapidly over the last months after a minor trauma. For the past 4 weeks, the lesion had frequently bled. The patient had consulted a physician who referred him to our out-patient department. As differential diagnoses, a vascular tumor, such as pyogenic granuloma or hemangioma, was considered. However, a soft tissue tumor, an atypical presentation of a cutaneous lymphoma or a squamous cell carcinoma, or a cutaneous metastasis of a malignant tumor could not be excluded. In addition, a rapidly growing mostly amelanotic melanoma was considered.

CYTOMORPHOLOGICAL ASSESSMENT:

A dry and clean microscopic slide was pressed against the tumor surface and a touch imprint for cytodiagnosis was easily obtained. The slide was air dried for 1 minute and subsequently stained using the "quick stain method" (Boehringer, Mannheim). Cytomorphological assessment was possible 3 minutes after the touch imprint of the lesion was obtained (Fig. 2). At low magnification the high cellularity of the specimen was strikingly obvious. Numerous isolated, solitary cells with only occasional aggregates of epithelial-like clusters were observed. The cells differed markedly in size and shape. However, even the smallest neoplastic cells were considerably larger (at least 5 times) than erythrocytes present in the specimen. The majority of cells was round and spindle-shaped and displayed abundant pale staining cytoplasm. Occasionally, finely dispersed pigment granules were identified. Nuclei of cells were characterized by a regular round and sharply defined contour and by evenly dispersed chromatin granules. In melanomas, the regular distribution of chromatin within cells and the uniformity of the nuclear chromatin pattern between cells is strikingly different from the variation in chromatin pattern of cells of most anaplastic carcinomas (6). The diagnosis of malignant melanoma was established.

DERMATOHISTOPATHOLOGICAL ASSESSMENT:

The assessment revealed a grossly symmetric melanocytic lesion with large atypical melanocytes scattered within the entire epidermis (Fig. 3). The cell nuclei varied in size and shape and some atypical mitoses were observed. The cytoplasm of a subset of cells revealed some pigment. Confluent nests of atypical melanocytes were found in the dermis within a thickness of 6 mm. There was no maturation of cells towards the base of the lesion. The diagnosis of a 6 mm thick primary nodal malignant melanoma was established.

DISCUSSION:

Cytomorphological assessment of skin lesions is a valuable diagnostic tool in various defined clinical situations. Specimens for diagnosis can be obtained with hardly any pain for the patient; local anaesthesia is not needed. As compared to surgical excision and histopathological examination, a diagnosis can be obtained within minutes rather than days. Using a 'quick-stain method– (e.g.by Boehringer, Mannheim), samples can be rapidly prepared for assessment at the bed side. This also allows to determine immediately, while the patient is present, whether sufficient material for diagnosis has been obtained or further specimens need to be prepared. Alternatively, specimens can be stained by the May-Grünwald-Giemsa procedure, which requires approximately one hour. As compared to 'quick-stain methods', some cytoplasmic and nuclear details may appear more distinct in regularly stained specimens.

From ulcerative and moist or frequently bleeding lesions, touch imprints can be readily obtained. From solid and non ulcerative lesions cytological specimens can be obtained by fine needle aspiration (FNA). Occasionally, it has been speculated that surgical manipulation of primary melanomas (e.g. by incisional biopsies or fine needle aspiration) might dislodge malignant cells, resulting in systemic metastases (7). Although this has not been confirmed in other studies (8), we do not perform FNA in lesions clinically suggestive of malignant melanoma. However, lesions where malignant

Figure Legends:

Fig. 1:

A 2,5 x 1,5 cm large pedunculated soft nodule in the left axilla of a 53-year-old male patient. As clinical differential diagnoses a pyogenic granuloma, a hemangioma, a soft tissue tumor, an atypical cutaneous lymphoma, a cutaneous metastasis or a malignant melanoma were considered.

Fig. 2:

Cytomorphology of the lesion. Numerous large cells with regular round and sharply defined nuclei. Abundant pale staining cytoplasm.

Fig. 3:

Histomorphology of the lesion. A 6 mm thick primary malignant melanoma with confluent nests of atypical melanocytes in the dermis and large atypical single melanocytes scattered within the epidermis.

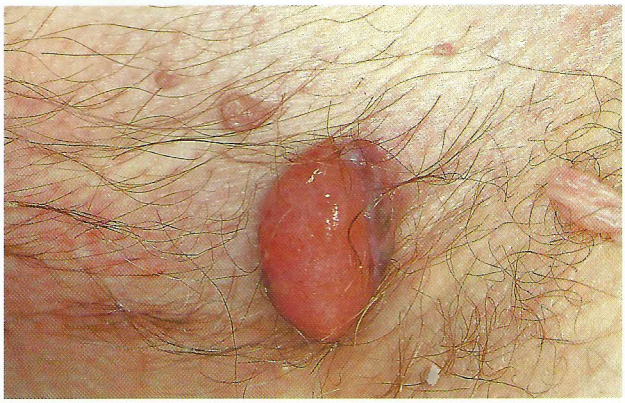
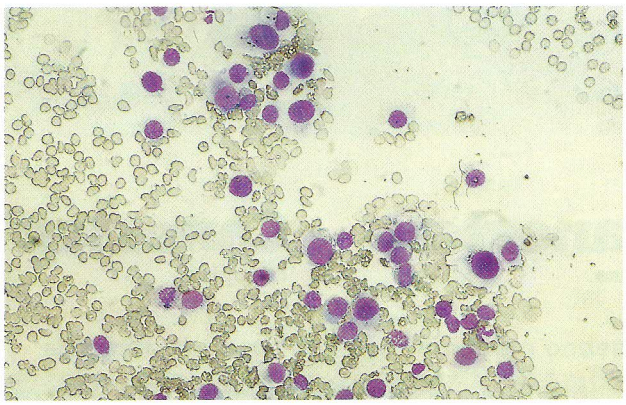


Figure 1

Figure 2



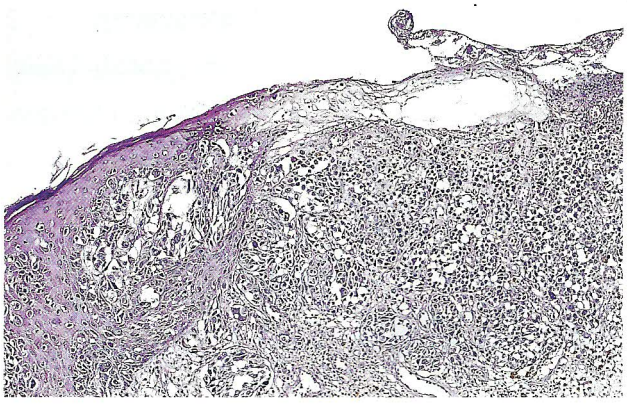


Figure 3

melanoma is considered in the differential diagnosis, frequently are characterized by small erosions or subtle ulcerations. Because of the high cellularity of malignant melanomas and the loss of cohesiveness of tumor cells, material sufficient for diagnosis often is obtained solely by touch imprints or by gently scraping erosive areas.

Cytodiagnosis is of special help in the assessment of lesions at parts of the body which are difficult to access by surgical excision, e.g. ear or eyelid (9, 10). A domain of cytodiagnosis in dermatology is the assessment of malignant skin tumors. Cytology is of less value for the diagnosis of inflammatory skin diseases, where it is most essential to appreciate the architecture of the lesion. The cytological features seen in the specimen of the patient presented above are highly diagnostic for malignant melanoma and differ markedly from features of other skin tumors (11). Basal cell carcinomas are characterized by strong cohesiveness of cells, which appear mostly uniform and have only a thin rim of cytoplasm. Aggregates of cells may display palisading of the peripheral cell layer. In specimens of squamous cell carcinomas keratinocytes with substantial variations in degree of differentiation and nuclear to cytoplasmic ratio are found. For these lesions, clusters of cells, as well as dyskeratotic acantholytic individual keratinocytes are characteristic. Undoubtedly, cytodiagnosis is useful for the assessment of palpable nodules in patients with a history of malignant melanoma. Palpable lymph nodes, suspicious of metastases, can be rapidly assessed by FNA. It can be helpful both for the patient and his caring dermatologist, when the diagnosis of a suspected metastasis can be confirmed in an out-patient setting during the patient's visit.

While cytomorphology is a valuable diagnostic tool in many clinical situations, also limitations must be clearly realized. Cytology is not at all a substitute for conventional histopathology, but should be regarded as a valuable complement (6). The architecture, as well as the depth and thickness of a lesion cannot be assessed. Subclassifications within defined groups of skin tumors are difficult, if not impossible in most circumstances. Definitely, regardless of cytomorphology, lesions clinically suspicious of a malignant tumor, must be excised and assessed by classic dermatopathology. However, in some cases, the cytomorphology of a lesion leads to a rapid diagnosis, or at least allows to narrow the array of differential diagnoses. This may help the clinician to initiate further required diagnostic and therapeutic procedures in a more rapid and well directed way.

REFERENCES:

1. Papanicolaou G.N., H.F. Traut (1943): Diagnosis of uterine cancer by the vaginal smear. The Commonwealth Fund. New York, New York.
2. Barr R.J. Cutaneous cytology. J Am Acad Dermatol 1984: 10, 163-180.
3. Gizycki-Nienhaus B.,P. Kaudewitz. Zytologische Aspekte zur Differentialdiagnose des Basalioms. Hautarzt 1992: 43, 629-633.
4. Brown C.L.,M.R. Klaber, M.G. Robertson. Rapid cytological diagnosis of basal cell carcinoma of the skin. J Clin Pathol 1979: 32, 361-367.
5. Slater D.N., G. Reilly. Fine needle aspiration cytology in dermatology: a clinicopathological appraisal. Brit J Dermatol 1986: 115, 317-327.
6. Orell SR, Sterrett GF, Walters MN, Whitaker D: Manual and atlas of fine needle aspiration cytology. Churchill Livingstone, Edinburgh, London, New York 1992.
7. Rampen FHJ, van der Esch EP. Biopsy and survival of malignant melanoma. J Am Acad Dermatol 1985: 12, 385-388.
8. Lederman J.S., A.J. Sober. Does biopsy type influence survival in clinical stage I cutaneous melanoma? J Am Acad Dermatol 1985: 13, 983-987.
9. Arora R., R. Rewari, S.M. Betheria. Fine needle aspiration cytology of eyelid tumors. Acta Cytologica 1990: 34,227-232.
10. Weiss J.S., P.Perusse P.F. Reale. Tear cytology in conjunctival melanoma. Am J Ophthalmology 1991: 111, 648-649.
11. Gizycki-Nienhaus B. Differentialzytologie des malignen Melanoms. Z Hautkr 1988: 63, 265-268.

AUTHORS' ADDRESSES
B.v.Gizycki-Nienhaus M.D.,Department of dermatology, Ludwig-Maximilians University of Munich, Frauenlobstrasse 9, D-8000 Munich 2, Germany
M.Volkenandt M.D. same address
B.Konz M.D. same address