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PRACTICAL DERMATOLOGY

# Basic Concepts in Skin Biopsy. Part I☆

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**Abstract** The aim of these reviews is to describe the reasons for performing skin biopsy, to provide indications for the choice of area to be biopsied and the preparation of the sample, and to summarize the various complications of dermatologic surgery. In addition, we present a guide for selecting the biopsy technique based on the suspected diagnosis and on the area to be biopsied. Finally, the various artifacts that can complicate interpretation of results are described, together with the methods used to prevent their appearance insofar as is possible. The aim of this guide is to improve the diagnostic yield of biopsies and to highlight the importance of a correct clinical–histological correlation.


**PALABRAS CLAVE**
Biopsia cutánea;
Anatomía patológica;
Dermatopatología;
Preparación histocitológica;
Técnica;
Complicación quirúrgica

## La biopsia cutánea: bases fundamentales. Parte I

**Resumen** En estas revisiones se pretende abarcar las diversas funciones de la biopsia cutánea, ciertas nociones básicas acerca de la elección del área a biopsiar y de la forma de procesar la muestra, así como las diversas complicaciones de la cirugía dermatológica de una manera breve. Además, se ofrece una guía del método a elegir para la realización de la biopsia en función tanto del diagnóstico de sospecha, como de algunas localizaciones que ofrecen mayores dificultades. Por último se analizan diversos artefactos que pueden dificultar la interpretación de las lesiones ofreciendo pautas para evitarlos en lo posible. Con esta guía básica pretendemos mejorar la rentabilidad de la biopsia y resaltar la importancia de realizar una correcta correlación clínico-histológica.


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## Introduction

The skin is easy to examine clinically and it is also easily accessible for carrying out small surgical procedures, which must nonetheless be done thoughtfully, not mechanically.[1] Biopsy procedures are a key step in medical diagnosis, particularly in dermatology because valuable histopathologic information derives from samples that are very readily obtained.[1] In the hands of a trained dermatopathologist skin biopsy becomes a valuable tool, and often a simple one, that can facilitate the accurate diagnosis and treatment of diverse dermatoses, particularly tumors. Although most skin biopsies are of good quality, diagnostic challenges arise when an inadequate sample is taken. Therefore, obtaining an adequate biopsy specimen is a complex process involving steps that must be followed carefully, starting with selecting the most appropriate biopsy technique, followed by proper preparation and handling of instruments; the process culminates with a competent dermatopathologist's examination of the tissue under a microscope.[2]

The clinical dermatologist must have clearly established indications for the procedure, fully explain the intervention to the patient, obtain informed consent, and finally take a tissue specimen that is representative. Clinicians often submit specimens that are too small,[3] however, or that have superficial defects due to electrocoagulation or inappropriate use of forceps, or that show signs of drying before they were placed in a fixing solution.

The clinical dermatologist also often chooses an inappropriate site or technique, or may fail to provide the pathologist with even minimal clinical information, making diagnosis difficult.[3,4]

Another important problem that is often underestimated is the clinician's lack of experience in interpreting histopathologic findings, particularly in inflammatory skin diseases.[5] The nature of dermatopathologic nomenclature, and the fact that dermatoses can have multiple names, can also lead to misunderstandings between the clinician and the dermatopathologist. A solid understanding of dermatopathology is therefore necessary if clinicians are to fully take advantage of the possibilities that skin biopsy offers. One study of biopsies of inflammatory lesions taken by dermatologists and other specialists found that the dermatologists' specimens more often yielded information that led to a specific diagnosis (77% of cases vs 41% for nondermatologists) and that the sites the dermatologists sampled were more appropriate.[6]

Some US dermatologists have used extenders—other physicians or nurses—to perform biopsies; these dermatologists report that such assistants have a certain tendency to submit ever smaller specimens of inadequate depth for the suspected diagnosis.[3] Dermatologists themselves, therefore, should do these procedures in the interest of avoiding diagnostic and therapeutic delays.[6]

Bearing these problems in mind, and in spite of the lack of consensus-based practice guidelines to help with deciding what size of specimen to take or skin biopsy technique to choose,[7] we will summarize the principles and concepts which are important from the perspective of the dermatopathologist and which we believe should be taken into consideration when a skin biopsy is performed. In this first paper we will cover the following points:

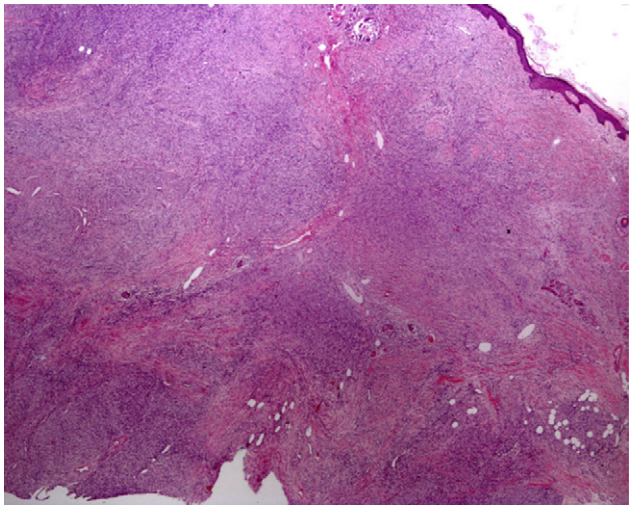

**Figure 1** Hematoxylin–eosin, original magnification ×20. Dermatofibrosarcoma protuberans extending to the deep margin of the excisional biopsy.

1. Functions of skin biopsy: the role of clinical information and technical aspects of the procedure
2. The biopsy: processing the specimen
3. Complications of dermatologic surgery
4. Selecting the biopsy site

## Functions of Skin Biopsy

Skin biopsy is performed mainly to assist in the accurate diagnosis of a skin disease. For the diagnosis of skin tumors, biopsy provides the best information; biopsy can also help with prognosis if the tumor proves malignant (by showing Breslow depth in melanoma) and can orient treatment, for example in relation to whether or not tumor-free margins are observed on inspection of the specimen (Fig. 1). Biopsy information is also useful in inflammatory dermatoses, allowing several clinical diagnoses to be weighed and finally confirmed or ruled out.

The specimen may be studied by means of conventional staining techniques, direct immunofluorescence, electron microscopy, immunohistochemical staining, tissue culture, polymerase chain reaction techniques, or fluorescence in situ hybridization.[8]

Skin biopsies are also taken for legal reasons, such as when a dermatopathologic diagnosis is needed to support clinical suspicion,[9] and the procedure may also strengthen good physician–patient relations by re-establishing confidence that a correct diagnosis has been made.

Finally, skin biopsies are sometimes required for monitoring purposes, to obtain objective evidence of clinical course, response to treatment, and possible side effects.

### Clinical Information

Providing the dermatopathologist with sufficient clinical information to work with might seem obvious, but unfortunately the necessary details are not always communicated. Given that time pressures rule in most clinical settings, too