

# Clinical and Imaging Evaluation of Nipple Discharge

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Nipple discharge, the spontaneous release of fluid from the nipple, is a common presenting finding that may be caused by an underlying intraductal or juxtaductal pathology, hormonal imbalance, or a physiologic event. Spontaneous nipple discharge must be regarded as abnormal, although the cause is usually benign in most cases. Clinical evaluation based on careful history taking and physical examination, and observation of the macroscopic appearance of the discharge can help to determine if the discharge is physiologic or pathologic. Pathologic discharge can frequently be uni-orificial, localized to a single duct and to a unilateral breast. Careful assessment of the discharge is mandatory, including testing for occult blood and cytologic study for malignant cells. If the discharge is physiologic, reassurance of its benign nature should be given. When a pathologic discharge is suspected, the main goal is to exclude the possibility of carcinoma, which accounts for only a small proportion of cases with nipple discharge. If the woman has unilateral nipple discharge, ultrasound and mammography are frequently the first investigative steps. Cytology of the discharge is routine. Ultrasound is particularly useful for localizing the dilated duct, the possible intraductal or juxtaductal pathology, and for guidance of aspiration, biopsy, or preoperative wire localization. Galactography and magnetic resonance imaging can be selectively used in patients with problematic ultrasound and mammography results. Whenever there is an imaging-detected nodule or focal pathology in the duct or breast stroma, needle aspiration cytology, core needle biopsy, or excisional biopsy should be performed for diagnosis. An excisional biopsy should be carried out with a thorough plan after a complete imaging evaluation. The evaluation of physiologic discharge or galactorrhea is primarily an assessment of endocrine factors.

**KEY WORDS** — biopsy, breast, magnetic resonance imaging, mammography, nipple discharge, ultrasound

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## Introduction

Nipple discharge is usually defined as fluid that escapes spontaneously from the nipple, while fluid

in the ducts that must be collected by aspiration, suction or massage, i.e. does not escape spontaneously, is referred to as “secretion”. Nipple discharge has been reported in 10–15% of women with benign

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breast diseases, and in about 1–3% of those with breast cancer [1,2]. The discharge, according to its appearance, can be described as milky, serous, greenish, brown, colored, cloudy, purulent, serosanguineous, or bloody. Among these, bloody discharge is the most worrisome because of its association with papillary lesions or carcinoma (Fig. 1). Only 4% of women with nipple discharge have breast cancer [3], although the reported incidences vary greatly [4–8]. However, in patients with bloody or serous nipple discharge, there is a higher prevalence of carcinoma, papilloma or other papillary lesions (74%). The majority (94%) of patients having fluid with secretory components were associated with fibrocystic changes and other nonproliferative breast lesions; only 6% were associated with papillomas [9]. It is, therefore, very important to evaluate the clinical significance of nipple discharge, especially when there is no palpable mass [9].

## Clinical Evaluation of Nipple Discharge

Spontaneous nipple discharge is often ignored. Women search for medical help usually because of colored or bloody discharge. Generally, only a small percentage of women with nipple discharge are found to have malignancy. The majority of discharges are caused by benign conditions such as fibrocystic changes, duct ectasia, benign papilloma or other papillary lesions, or other nonproliferative lesions [9,10]. Evaluation of the discharge is mainly based on a careful history, physical examination, specific imaging studies, cytologic studies, and/or histopathologic studies.

## History

A history of nipple discharge in association with a self-discovered mass is suggestive of neogrowth or cancer. The clinically significant discharge is usually spontaneous, not a result of forcible manual compression or passive induction. The discharge is also significant if it is unilateral, or localized to a single

quadrant or a single duct, and occurs in an older woman. Discharges associated with cancer can be bloody, watery, serous or serosanguineous. Discharges due to benign causes are frequently bilateral and multiductal, and are usually milky, green or greenish blue [11]. Discharge as a sole finding without any palpable mass is rarely related to breast cancer [2]. Nipple discharge in a patient carrying risk factors such as a family history of breast cancer on the maternal side, or a past history of breast cancer, requires more vigilant investigation or close surveillance.

## Physical Examination

In addition to routine inspection and palpation of the entire breast and lymph node-bearing area, the nipple-areola complex should be carefully inspected for subtle changes in the surface, retro-areolar masses, and nipple discharge [3]. The physical examination is performed by first squeezing the nipple between the finger and thumb to check the character of the discharge. Then, the nipple is cleaned, and further forcible manual compression is applied to the breast from the peripheral to the central part according to the different clock directions, preferably radially in a clockwise fashion starting from the 12 o'clock position. A diagram is used to record the location of the duct or quadrant related to the discharge. We prefer to localize any mass or abnormalities along a specific radial of a clock on the breast in centimeters from the margin of the nipple attachment. The suspected area of abnormality can be marked on the skin with a skin marker, so that imaging studies can be correlated with the physical findings.

## Specific Imaging Studies

### *Mammography*

The majority of physicians agree that mammography is an effective screening tool. The benefit of detecting a small cancer using screening mam-

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