

Ductography: Role in Pathological Nipple Discharge

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ABSTRACT:

Ductography (DG) or Galactography is investigation of choice for evaluation of unilateral, single duct, spontaneous nipple discharge regardless of its appearance. It is an invasive procedure needs cannulation of the lactiferous duct for injection of the contrast for diagnosis of the abnormality.

Since pathological nipple discharge may be caused by benign pathology, such as fibrocystic disease, ductal ectasia, papillomas, or by carcinoma. Identification of intraductal abnormalities with DG is important. It helps in providing the accurate diagnosis, the location and depth of the lesion. When ductal ectasia or fibrocystic changes are causing the discharge, conservative follow-up is considered.

DG can be diagnostic or preoperative for localization to guide accurate surgical intervention.

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DG of the breast is an underused procedure because cannulation of the duct orifice is a source of great stress as the opening of duct is very small and some time it is difficult to cannulate the duct. There are 17-20 ducts opening on the surface of nipple the one with pathology can only be identified when discharge is seen during the procedure. The procedure is easy to perform if the performing radiologist has learned the basic principles of DG and has proper equipment and patience.

Keywords: Ductography, galactography, nipple discharge, mammography, MR ductography, Mammary ductoscopy, Cytology, Ultrasound breast.

Ductography: role in pathological nipple discharge

The lactiferous ducts drain the parenchyma and bring milk in the lactating woman. This duct system is the site of development of most benign and malignant epithelial lesions and some of them may be associated with nipple discharge.

Approximately 85% of women have physiological nipple discharge. It is the third most frequent presenting complaint of the women coming to breast clinical for consultation. Many women can squeeze out a small amount of yellowish, greenish or brownish discharge, it is not a cause for concern and is usually benign in origin and this is often called “physiologic” discharge.

Spontaneous nipple discharge unilateral, single-pore regardless of its appearance is most of the time pathological in origin (1-5). The benign causes of ductal discharge are papilloma, pillomatosis, ductal ectasia and fibrocystic disease and malignant cause is breast cancer.

Nipple discharge can be classified as spontaneous or induced and as unilateral or bilateral.

Different modalities can be used for the patients heaving nipple discharge taking in consideration age, clinical presentation and availability.

MAMMOGRAPHY:

Routine mammography is usually normal in patients with nipple discharge caused by benign conditions. When the cause of discharge is malignant the mammogram is more likely to be abnormal but is still can be negative in good percentage.

Mammography should be performed in all patients complaining of pathological nipple

discharge before ductography if they are above 35 years of age (6)

ULTRASOUND:

Usually ultrasound is first modality of choice in young patients and the one having normal mammogram. If the patient has a palpable mass on the physical examination it can tell its characteristics; whether the lesion is cystic or solid. High-resolution ultrasound machines are excellent in visualizing dilated ducts (Ductal ectasia) and intraductal filling defects (7)

Ultrasound can help for percutaneous localization of intraductal filling defect or lesion if on the day of surgery there is difficulty in cannulating the duct. Ultrasound-guided vacuum core biopsy can be a therapeutic modality in small benign lesion (8).

CYTOLOGICAL EXAMINATION OF NIPPLE DISCHARGE:

The examination of nipple discharge has long been considered a useful test for detection of underlying disease. It is simple to perform slides are made from the nipple discharge obtained by squeezing the nipple. The slides are prepared by papanicolaou or May-Giemsa staining in all patients. Cytology smears of the discharge material provide information about atypia and malignancy and also about papillary formation of the exfoliated cells. Tests such as Hemocult help to detect occult blood in the secreted fluid. Modern immunological tests can be performed on cytology smears where occurrence of high levels of carcinoembryonic antigen could indicate a latent malignancy (6). Intraductal papillomas are characterised by the presence of tightly connected ductal cell clumps. The cells and nuclei are uniform in size, and non-mitotic. Erythrocytes are much more frequently seen in patients with intraductal papillomata.

The cytology of nipple discharge is useful in evaluating pathological discharge, negative cytology with negative imaging is not enough to avoid surgery in cases of suspicious clinical presentation.

DUCTOGRAPHY:

The indication for DG is spontaneous and unilateral discharge (1-5). The appearance of the fluid is not of clinical importance the common

color seen in clinical practice is bloody or serosanguinous (Duct papilloma, carcinoma) or greenish, serous or clear (Ductal ectasia, fibrocystic changes).

DG is not used to differentiate with certainty benign papillomas or papillomatous from intraductal malignancy, instead DG is important in identifying an intraductal defect and its exact location for biopsy or surgical removal.

The appointment for DG must be given to the patient when she has discharge especially if the discharge is intermittent (3).

Different techniques are in use for DG 30-gauge blunt tip

sialography cannula, blunted needles, jabczenski ductogram cannula etc. Difficulty in cannulating the duct is the most discouraging obstacle in performing DG. Probing the duct with dilators and attempting to place the metallic cannula can cause pain, laceration of nipple and ostium of the duct.

The wire guided DG technique (1) is cost effective, simple and easy to perform the required material is available in every department even at remote areas. The best part of this technique is that even in inexperienced hands the harm to the patient is less likely.

MR DUCTOGRAPHY (MRD):

Advancement in MR machines and new surface coils provides good images of breasts and made possible to achieve diagnostic quality images for MRD (9). It offers a number of advantages; the technique shows all mammary ducts fully in the field of view, whereas conventional DG can visualize only the duct into which contrast is injected. This benefit of MRD allows the detection of additional intraductal lesions, including those in different ducts and if the mammary duct is completely occluded, conventional DG cannot show tumours distal to the occlusion while MRD can visualize distal ducts, and can detect additional intraductal lesions. The possible limitations of MRD are similar to those of conventional MRI, including the inability to scan patients with implanted pacemakers and image degradation caused by motion. In clinical practice, availability of MRI, the high cost and limited expertise remain obstacles to its widespread use.

The radiology departments having facilities and expertise of MRD can use it as diagnostic tool and can use conventional DG for localization of intra ductal pathology for surgical excision.

MAMMARY DUCTOSCOPY (MD):

MD has raised new possibilities in the diagnosis and treatment of nipple discharge. Introduction of the ductoscope needs dilatation of duct ostium by lacrimal dilators. This technique allows direct visualization of the lesion and biopsy of intraductal lesions. It can also help in localization of lesion for duct excision surgery (6).

CONCLUSION REMARKS:

With the advent of new modalities like MRD and MD the standard of patient care will improve. At present these facilities are available to very limited population. The importance of DG for preoperative localization is still unchallenged as most of the time the lesions are not palpable and the location of the lesion seen on images in the compressed breast may change position on the operating table where the patient is in supine position and breast is without compression, especially when the lesion is deep. Without preoperative localization or injection of methylene blue it may not be possible to excise the lesion (10). Therefore need for expertise in conventional DG is required in all the departments having breast work up.

According to Gonzalez P.*et al.* [11] despite advances in breast imaging techniques over the past decade, state-of-the-art ductography continues to be highly accurate for identifying causes of pathological nipple discharge. This may obviate additional imaging studies.

In my opinion the DG will remain gold standard for coming many years. I will suggest to my radiological colleagues heaving interest in breast diseases to learn this technique.

References:

1. Aslam MO, Ramdan S. Al-Adwani M. Technical innovation: wire-guided ductography. *European Journal of Radiology*. 81, 1543–1545(2012).

2. S Horatio Slawson, Braddley A. Johnson, Ductography: How to and what it? *Radiographics*. 21,133-150(2001)
3. Tucker AK, Ng YY. *Text book of Mammography*, 2nd edition. Churchill Livingstone. 260(2001).
4. Cardenosa G, Doudna C, Elelund GW. Ductography of the breast: Technique and findings. *AJR Am J Roentgenol*. 162, 1081–1087(1994).
5. Tabar L. Dean PB. Pentek Z. Galctography: the diagnostic procedure of choice for nipple discharge. *Radiology*. 149, 31-38(1983).
6. Al Sarakbi1 W, Worku D, Escobar PF. Mokbel K. Breast papillomas: current management with a focus on a new diagnostic and therapeutic modality. *International Seminars in Surgical Oncology*, 3:1(2006).
7. Rissanen T, Reinikainen H, Apaja-Sarkkinen M. Breast Sonography in Localizing the cause of Nipple Discharge . Comparison with galctography in 52 patients. *J Ultrasound Med* . 26:1031–1039 (2007)
8. Dennis MA, Parker S, Kaske TI, Stavros AT, Camp J: Incidental treatment of nipple discharge caused by benign intraductal papilloma through diagnostic Mammotome biopsy. *Am J Roentgenol*. 174(5), 1263-8. (2000).
9. Kanemaki Y. Kurihara Y. Itoh D. Kamijo K. Nakajima Y. Fukuda M. Van Cauteren M. MR Mammary Ductography Using a Microscopy Coil for Assessment of Intraductal Lesions *AJR*.182:1340–1342(2004).
10. Hou MF, Huang TJ, Huang YS, Hsieh JS. A simple method of duct cannulation and localization for galactography before excision in patients with nipple discharge. *Radiology*. 195, 568–569(1995).
11. Gonzalez P. Whitman G. Dryden M. Liu P. Dogan, B. Is ductography still warranted in the 21st Century? *AJR*. 198 no. 5 Supplement May 2012