

## **Medical Policy Manual**

**Topic:** Breast Duct Endoscopy (Ductoscopy)

**Date of Origin:** May 4, 2004

**Section:** Medicine

**Last Reviewed Date:** May 2014

**Policy No:** 112

**Effective Date:** August 1, 2014

### **IMPORTANT REMINDER**

Medical Policies are developed to provide guidance for members and providers regarding coverage in accordance with contract terms. Benefit determinations are based in all cases on the applicable contract language. To the extent there may be any conflict between the Medical Policy and contract language, the contract language takes precedence.

PLEASE NOTE: Contracts exclude from coverage, among other things, services or procedures that are considered investigational or cosmetic. Providers may bill members for services or procedures that are considered investigational or cosmetic. Providers are encouraged to inform members before rendering such services that the members are likely to be financially responsible for the cost of these services.

### **DESCRIPTION**

Breast duct endoscopy is a technique that provides for direct visual examination of the breast ducts through nipple orifice cannulation and exploration. It may also be referred to as ductoscopy or mammoscopy. The technique has been investigated in the following clinical situations:

- Diagnostic technique in women with spontaneous nipple discharge, where endoscopy might function as an alternative to surgical excision.
- Technique to obtain cellular material to stratify women for risk of breast cancer.
- As a follow-up for women with atypical cytology as detected by ductal lavage (see Medicine policy No. 93).
- Delineation of intraductal disease to define margins of surgical resection.
- The direct delivery of therapeutic agents, including photodynamic therapy, laser ablation, topical biological agents, etc.

Of related interest, three-dimensional reconstruction techniques of CT-scans are now being studied in another approach referred to as virtual ductoscopy.

**Note:** This policy addresses breast duct endoscopy only. For discussions of breast epithelial cell cytology (ductal lavage), see Medicine, Policy No. 93.

## **MEDICAL POLICY CRITERIA**

Breast duct endoscopy, also known as ductoscopy, is considered **investigational** for all indications, including but not limited to lesion localization, preoperative evaluation, or intraoperative guidance in breast cancer.

## **SCIENTIFIC EVIDENCE**

Among women with nipple discharge, diagnostic follow-up may be conducted with mammogram, ultrasound, core needle biopsy, and/or ductal excision.<sup>[1]</sup> Validation of the proposed use(s) of breast duct endoscopy in comparison with these standards of care must fulfill 3 parameters:

1. Demonstration of technical feasibility, including assessment of its reproducibility and precision. For comparison among studies, a common standardized protocol is necessary.
2. Demonstration of diagnostic performance (sensitivity, specificity, positive and negative predictive values) of breast duct endoscopy compared with the gold standard test for each proposed indication.
3. Demonstration of clinical utility, i.e., how the results of breast duct endoscopy can be used to benefit patient management and improve health outcomes compared with the standard of care. The clinical utility of both positive and negative tests must be assessed. Relevant outcomes of a negative test (i.e., suspected pathology is not present) may be avoidance of more invasive diagnostic tests or avoidance of ineffective therapy. Relevant outcomes of a positive test (i.e., suspected outcome is present) may also include avoidance of a more invasive test plus the institution of specific, effective therapy. Demonstration of clinical utility is best achieved by randomly allocating breast duct endoscopy versus current diagnostic or follow-up testing for each proposed indication to an appropriate patient spectrum, determining treatment based on test results, and allowing for long-term follow-up of health outcomes.

## **Literature Appraisal**

No randomized, controlled trials have been reported which compare breast duct endoscopy with other standard diagnostic testing. Current evidence is limited to preliminary feasibility studies and outcomes are mixed.<sup>[2-4]</sup> For example, Vaughan et al reported ductoscopy to be useful for lesion localization and intraoperative guidance, but not helpful in preoperative evaluation.<sup>[5]</sup> In contrast, a literature review by Uchida et al concluded that ductoscopy was useful for diagnosing intraductal lesions in patients with nipple discharge, but that ductoscopic biopsy and therapeutic interventions need further development.<sup>[6]</sup>

The following articles are representative of the content and study design quality of current published literature:

- In a recent study from Turkey, the efficacy of ductoscopy in the diagnosis and management of intraductal lesions was investigated.<sup>[7]</sup> Data on 357 ductoscopic investigations from patients with nipple discharge were collected prospectively. Seventy-five patients were diagnosed as having intraductal papillary lesions and these cases were evaluated by final histopathology (55 solitary, 14 multiple papillomatosis, 6 premalignant or malignant lesions). The sensitivities of investigation methods for papillomas in this study were 72 % in ultrasonography, 62.9 % in mammography, 81.4 % in galactography, and 86.6 % in ductoscopy. With ductoscopic papillomectomy (DP), almost 30 % of patient with solitary papilloma did not require further extensive surgery. Authors suggest that ductoscopy is a minimally invasive intervention and can aid in the follow-up of lesions proven to have no atypia.
- In a 2013 study, the role of ductoscopy for detecting intraductal anomalies in patients with nipple discharge was compared to conventional tests to find an effective combination of both approaches.<sup>[8]</sup> Prior to duct excision, ductoscopy was performed in 97 women. Breast sonography reached the highest sensitivity (64.1%) and efficiency (64%); mammography had the highest specificity (100%). The sensitivity of ductoscopy was 53.2%, its specificity 60%, and its efficiency 55.1%. Among combinations of all methods, the combination ductoscopy + galactography were the most sensitive (80%). Mammography, magnetic resonance imaging, and ductoscopy were each 100% specific. Ductoscopy was the most efficient (75%) single method. Authors suggest ductoscopy is a valuable test for diagnosing intraductal lesions in patients with nipple discharge.
- Louie conducted a retrospective study of patients with nipple discharge who underwent ductoscopy and had a diagnosis of cancer.<sup>[9]</sup> In this small series of cancer patients, duct wall irregularities or intraluminal growths were noted during ductoscopy in 57% (8 of 14) of breast cancer patients. The authors concluded that no clear morphologic changes noted during ductoscopy definitively indicated malignancy.
- Hunerbein et al. reported results using a new, rigid ductoscope during the evaluation of 66 patients with breast cancer and 45 patients with nipple discharge.<sup>[10]</sup> In this case series, intraductal lesions were noted in 41% of patients with breast cancer. In addition, 16% of “normal” ducts had extensive intraductal lesions.
- Similarly, Dubowy and colleagues reported on the use of a new, rigid ductoscope for intraductal biopsy.<sup>[11]</sup> Although patient selection criteria were not specified, the device was tested against mammography and/or galactography among patients with breast cancer (n=53) or nipple discharge (n=49). An unspecified number of patients also underwent ductal lavage. The researchers reported that their technique was more accurate than the comparator tests; however, sensitivity, specificity, and negative and positive predictive values of any of the tests were not reported, meaning that overall accuracy between diagnostic methods was not able to be directly compared. In addition, due to lack of randomization and long-term follow-up, it is not clear whether additional testing and biopsy with this ductoscope prototype resulted in improved health outcomes.
- Grunwald and colleagues compared various diagnostic tests in patients with breast disease.<sup>[12]</sup> In this study, ductoscopy was compared to mammography, galactography, sonography, magnetic resonance imaging (MRI), nipple smear, fine needle aspiration cytology (FNAC), and high-speed core biopsy. However, not all patients received all evaluations; for example, only 19 patients had galactography. There were 71 ductoscopies that were followed up by open biopsies. Three invasive and 8 ductal carcinomas in situ were found, as well as 3 atypical ductal hyperplasias, 44 papillomas/papillomatoses (all considered to be disease); and 13 benign findings. Feasibility of ductoscopy was 100% in this series. Duct sonography showed the highest sensitivity (67.3%), followed by MRI (65.2%), galactography(56.3%), ductoscopy (55.2%), and FNAC (51.9%). The highest specificity was shown by FNAC, core biopsy, and galactography (each 100%), followed by mammography (92.3%), nipple smear (77.8%), ductoscopy, and duct sonography (each 61.5%); the

lowest specificity was displayed by MRI (25.0%). The authors felt these results were promising. In contrast, in a study from China involving 1,048 women evaluated between 1997 and 2005, Liu identified 49 of 52 (94%) of cancers among women presenting with spontaneous nipple discharge.<sup>[13]</sup> However evaluation and follow-up was limited among the 489 cases that had normal ductoscopy and cytology. The authors did note that 77 of these cases underwent tissue diagnosis within a median follow-up time of 19 months during which one malignancy (DCIS) was diagnosed.

- In 2010, Tang and colleagues conducted a literature review and reported a continued lack of prospective randomized trials, noting that these “would be crucial to validate current opinion.”<sup>[14]</sup> The authors concluded that the role of breast duct endoscopy in breast cancer screening and conservative surgery has yet to be fully defined.

While published data suggest that breast duct endoscopy is feasible, outcomes from recently published nonrandomized studies on diagnostic capability continue to be mixed, with many concluding that additional data from larger clinical trials will be required to determine the sensitivity, specificity and positive and negative predictive values of breast duct endoscopy. Although a number of authors have concluded that breast duct endoscopy is a valuable diagnostic tool, there is a lack of direct comparison between breast duct endoscopy and other diagnostic techniques. In addition, there is minimal data reporting on how the results of breast duct endoscopy influence either the decision to undergo biopsy or excision, or influence the extent of the excision.<sup>[2,15-21]</sup>

### **Clinical Practice Guidelines**

No evidence-based guidelines or position statements were found that recommend the use of breast ductoscopy for screening, diagnosis, or treatment of breast cancer. The 2014 National Comprehensive Cancer Network (NCCN) guidelines are silent on the use of breast duct endoscopy for evaluation of patients with nipple discharge, or any other indication.<sup>[1]</sup>

### **Summary**

The diagnostic accuracy and clinically utility of breast duct endoscopy have not clearly been established. Current data are insufficient to permit scientific conclusions regarding the role breast duct endoscopy in the evaluation and management of patients with known or suspected breast cancer; therefore, the use of this technology is considered investigational. Additional studies are needed to better define the net contribution of breast duct endoscopy beyond that offered by current standard of care.

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## CROSS REFERENCES

[Epithelial Cell Cytology in Breast Cancer Risk Assessment and High Risk Patient Management \(Ductal Lavage and Suction Collection Systems\)](#), Medicine, Policy No. 93

<b>CODES</b>	<b>NUMBER</b>	<b>DESCRIPTION</b>
CPT	19499	Unlisted procedure, breast
HCPCS	No code	