

About Mammary Ductoscopy

The purpose of this information is to help you understand what is going on in your body and explain the procedure your doctor is recommending for you – a procedure called *mammary ductoscopy* (*duck-tos-cope-ee*).

What is a Mammary Ductoscopy?

Mammary ductoscopy is a new technology with the ability to view and collect epithelial cells and other abnormalities in the tiny milk ducts of your breasts — abnormalities so small they are often missed on mammogram and ultrasound tests. Mammary ductoscopy uses a tiny (0.9 mm in diameter – that’s about the size of this “o”) fiberoptic, flexible scope that is inserted into the milk duct through the nipple and threaded through the labyrinth of milk ducts deep in the breast. Unlike mammography or other x-ray “pictures,” mammary ductoscopy allows the physician to actually see in “real-time” and in color what is happening inside the milk ducts.

An imaging system magnifies breast tissue up to 60 times its actual size and projects the pictures onto a computer monitor screen. Using this technology, your surgeon will be able to see abnormalities in your mammary ducts before they can be detected with standard mammography and MRI.

Most breast cancers begin in the milk ducts

Almost all breast cancers originate in the tiny mammary ducts of the breast where, in the early stages, they grow slowly. *Ductal carcinoma in situ* (DCIS) (*duck-tul car-sin-oma in sigh-two*) is also called *atypical or epithelial hyperplasia* (*epi-thee-lee-al hyper-play-jah*), is an early form of breast cancer that cannot be detected by physical examination alone. According to the government Centers for Medicare and Medicaid Services¹, DCIS is responsible for 80% of all cancerous breast lumps. Cancerous changes occur in the cells lining the milk ducts, but are completely contained within the ducts. If DCIS is left untreated it may, over a period of years, begin to invade the breast tissue surrounding the ducts, and become invasive breast cancer.

MEND

MEND, or *Manually Expressed Nipple Discharge* is liquid or bloody discharge that comes from the nipple of non-breast-feeding women when the nipple area is massaged. MEND is a symptom associated with an increased incidence of breast cancer and requires in-depth examination. In fact, MEND has been associated with breast cancer in women who have had normal mammograms. Until now, it was impossible to determine what exactly caused MEND. Today, mammary ductoscopy allows surgeons to identify and locate the exact source of MEND when it first appears rather than waiting until it develops into invasive breast cancer. Early diagnosis provides greater choices in breast-sparing treatments, such as hormone therapy and lumpectomy.

Understanding the internal structure of your breast will help you better understand why your doctor has recommended that you have a mammary ductoscopy.

The Internal Structure of Your Breast

Basically, the breast has four structures: *lobules or glands; milk ducts; fat* and *connective tissue*. There are about 15-20 lobes in each breast arranged in a circle around the nipple. The lobes empty into the milk ducts, which in turn, travel throughout the breast towards the nipple. There, they merge into 6-10 larger ducts called *collecting ducts* that enter the base of the nipple and connect with the outside on the surface of the nipple. Breast milk follows this route on its way out from inside the breast to the feeding infant.

Imagine entering the breast “backwards” – from the outside of the body through the nipple and into the breast rather than from inside the breast, through the nipple and to the outside. On this backwards journey, the ducts are large at first, but deeper into the breast they branch out like a tree and become smaller and smaller. Just like the inside of your blood vessels and the lining of the tubes in your lungs, the inside of each milk duct is lined with cells called *epithelial cells*. Changes in these cells have been associated with an increased risk of breast cancer. Women whose cancers are caught and treated early at the cellular level, before the cancer has spread, have a much better chance of surviving than those whose cancers are found at a later stage. Early detection can often mean less dramatic and disfiguring breast surgery and, depending on the type of tumor, maybe less-aggressive follow-up treatment.

What is the procedure for Ductoscopy?

Mammary ductoscopy can be performed as an outpatient in a clinic or your doctor’s office. It is relatively painless, usually does not require a general anesthesia (unless you are having a lumpectomy at the same time), and no incision is made in your breast. Ductoscopy uses the milk duct’s natural skin surface opening on your nipple as a route to examine your milk ducts.

Slight pressure or suction is applied to the nipple to help draw fluid out of the milk ducts to the skin surface as a way of finding the milk duct’s normal opening on the nipple. Once the duct is located, a tiny catheter is inserted into the duct through which the surgeon inserts the tiny fiberoptic ductoscope. The surgeon straightens the ducts by moving your breast as the scope navigates through them.

If nipple discharge or cell debris clouds the view, normal saline is injected through the working channel of the scope. Samples of mammary epithelial cells can be collected onto slides for analysis.

The scope is connected to a monitor that provides magnified colored images as the scope moves through the ductal system. A normal duct appears as a shiny white tunnel. Red patches usually correlate with duct hyperplasia. DCIS and other lesions have a characteristic appearance.

What if my surgeon finds something serious during Ductoscopy?

Mammary ductoscopy provides a way for surgeons to perform several tasks during one procedure that ordinarily might require several procedures and doctor or hospital visits. Not only is it possible for the surgeon to collect mammary epithelial cells for analysis, but should a suspicious lump be found, the surgeon can biopsy it during the ductoscopy.

Before ductoscopy became available, biopsy of a lump was a separate surgical procedure where the surgeon made an incision into the breast tissue, leaving a scar. Today, lesions found inside the milk ducts can be biopsied where they are found without cutting into and scarring the breast. If the breast biopsy shows that the lump is cancerous, ductoscopy guides your surgeon toward the maximum conservation of your breast by identifying the precise location of abnormal tissue prior to lumpectomy.

For years, finding “clean margins” – that is, deciding how much tissue should be removed during lumpectomy to ensure that all the cancer was removed with the lump –often required repeat surgeries. Using ductoscopy, the surgeon is better able to decide how much tissue should be removed because he can actually see the disease through the scope. This ability may help to reduce the number of procedures you may have to undergo and also possibly reduce the amount of scarring on your breast. A clinical study² of 201 women undergoing lumpectomy, found that the re-operation rate was reduced by 78% when patients underwent a ductoscopy at the time the lumpectomy was performed.

Is Ductoscopy painful?

An anesthetic cream is applied to numb the nipple area. Once it is numb, a local pain-killer is injected. This is similar to the procedure a dentist uses: to reduce any discomfort when you're having a tooth filled — a liquid anesthetic is applied to your gums before you receive the injection of novocaine. Most women, however, report little-to-no discomfort — in fact, many say it is no more uncomfortable than a standard mammogram. However, there are several ways a physician can give you relief from discomfort should you experience it: anesthesia cream applied to your skin, local anesthesia, and anesthesia put directly into the ductal tree.

How long does a Ductoscopy take?

The amount of time required for ductoscopy depends on what procedures the surgeon performs and how easy it is to navigate the scope throughout your milk ducts. Naturally, an examination of the milk ducts will not take as long as a biopsy or a ductoscopy assisted lumpectomy. Usually, though, the entire procedure takes about 45 minutes.

Will my insurance pay for Ductoscopy?

There is often a lag between the time a new procedure becomes available to patients and the willingness of insurers to pay for it. Many insurers are currently paying for ductoscopy on a case-by-case basis. Your physician must request something from your insurance company called a *predetermination* for the procedure before actually performing the ductoscopy.

References:

¹ CMS Medicare Coverage Policy #CAG-00074N. Breast biopsy (percutaneous image guided) for palpable lesions. Available at: www.cms.gov/coverage. Sited: 9-02-02.

² Dooley WC. Routine operative breast endoscopy during lumpectomy. *Manuscript submitted for publication.*