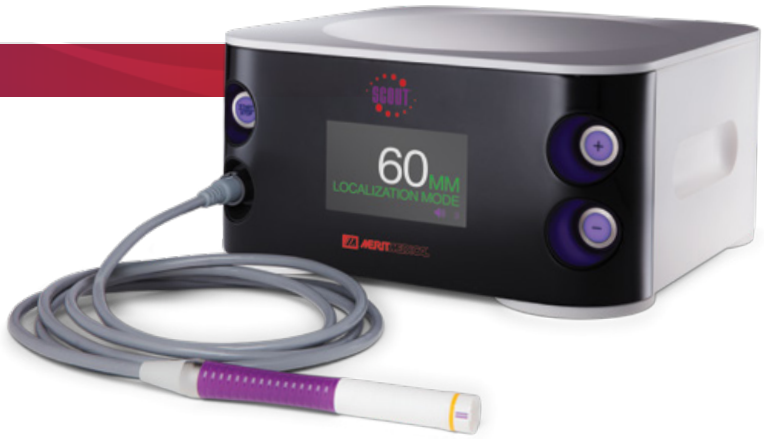
Breast-Conserving Surgery Overview



About Breast-Conserving Surgery

The goal of breast cancer surgery is to remove cancer from the breast and determine the stage of disease.[4] As recently as the 1970s, the standard treatment for women diagnosed with breast cancer was a mastectomy, or removal of the whole breast, sometimes including lymph nodes.[1] Thanks to technological advances in detection and new treatment approaches, many women have the option to save their breasts by choosing breast-conserving surgery (BCS).

With BCS, only cancerous tissue, plus a rim of normal tissue, is removed during a lumpectomy procedure. How much breast tissue is removed depends upon the size and location of the tumor. Research has shown that BCS followed by radiation therapy is as effective as a mastectomy in decreasing the risk of local cancer recurrence for most women.[4]

Timeline

1882

William Halsted, M.D. performs the first radical mastectomy.

1969

Invention of the modern mammogram enables doctors to find smaller (non-palpable) breast cancers.

1970s

Development of pre-operative wire localization technique aids in surgical biopsies of non-palpable lesions found on screening mammography.

Breast-conserving surgery (lumpectomy) emerges as an alternative to mastectomy.

Intraoperative wire localization is introduced to help guide surgeons to a lumpectomy tumor site and potentially decrease the volume of healthy tissue removed.

1990s

Researchers conclude that breast-conserving surgery, followed by whole breast radiation therapy (RT), results in equivalent survival outcomes.

2000s

The vast majority of women diagnosed with early-stage breast cancers choose to have a lumpectomy instead of a mastectomy.

Researchers begin evaluating accelerated partial breast irradiation as a more targeted option for post lumpectomy radiation therapy.

2015

Researchers publish data showing that accelerated partial breast irradiation (APBI) with brachytherapy, a more precise and faster treatment, offers the same clinical benefit as whole breast irradiation (WBI). WBI exposes the entire breast to radiation over a period of several weeks. APBI with brachytherapy targets radiation to the lumpectomy cavity only, sparing healthy breast tissue; and, is completed in just 4-5 days.

SCOUT radar localization system is introduced to offer greater precision and efficiency in breast cancer surgery.

BCS Techniques: Wire Localization

Prior to 2015, surgeons generally relied on wire localization (WL) to locate a tumor during breast-conserving surgery. With wire localization, a radiologist guides a thin, hooked wire through the skin to the lesion. The surgeon then uses the wire to help guide the removal.

Challenges of WL:

- The wire must be placed the same day as the lumpectomy procedure, which requires a high degree of coordination between radiology and surgical schedules. Not only can this lead to costly delays in the operating room, it often forces women to wait long periods of time with a wire protruding from their breast.
- Many patients are unnerved by wires hanging out of their breasts, especially when they have to transport themselves from radiology to the operating room.
- Wire kinking, migration and/or displacement can occur before surgery, reducing the accuracy of finding the tumor and increasing the rate of local recurrence.
- The ideal skin entry site for the wire is often distant from the ideal skin incision site for the surgeon, increasing the potential for less than optimal cosmetic outcomes.
- If a wire is accidentally cut or dislodged during surgery, guidance to the tumor is lost, leading to a failed surgery or removal of excessive tissue.
- Wire localization may result in inadequate removal of the cancer, requiring a second surgical procedure to remove more tissue.

BCS Techniques: SCOUT® Radar Localization System

In 2014, the SCOUT radar localization system was cleared by the FDA for use by surgeons and radiologists to precisely locate

and guide the removal of the target tissue during a lumpectomy or surgical biopsy procedure. SCOUT® was developed to make breast cancer surgery easier for women and more efficient for the healthcare system.

The FDA-cleared SCOUT system features radar to detect a reflector that is placed at the tumor site at any time prior to a lumpectomy or surgical biopsy. During the procedure, the surgeon scans the breast using the SCOUT guide, which emits infrared light and a micro-impulse signal to detect the location of the reflector. Real-time audible and visual indicators assist the surgeon in accurately locating the reflector, along with the target tissue. This higher level of localization precision allows the surgeon to plan a surgical approach that may result in a better cosmetic outcome.

Advantages of SCOUT:

- Gives surgeons greater confidence in removing all cancerous tissue.
- Decouples the radiology and surgical schedules, which can improve workflow and may result in more patients receiving care faster.
- Reduces patient anxiety associated with placement of the wire on the day of surgery.
- Enables lumpectomies to be scheduled early in the morning, which can reduce long wait times for patients who are unable to eat or drink prior to surgery.
- Eliminates the need for wires protruding from the patient's breast, which may lead to better patients experience.

AMONG WOMEN DIAGNOSED WITH EARLY-STAGE (I OR II) BREAST CANCER:[4]

59% have breast-conserving surgery.

36% undergo a simple (total) mastectomy, which is the removal of the whole breast.

AMONG WOMEN DIAGNOSED WITH LATE-STAGE (III OR IV) BREAST CANCER:[4]

13% have breast-conserving surgery.

60% undergo a simple mastectomy.

References

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3. Alderliesten, T., Loo, C., Pengel, K., Rutgers, E., Gilhuijs, K., & Marie-Jeanne T. F. D. Vrancken Peeters. (n.d.). Radioactive Seed Localization of Breast Lesions: An Adequate Localization Method without Seed Migration. The Breast Journal, 594-601.
4. American Cancer Society. Breast Cancer Facts & Figures 2017-2018. Atlanta: American Cancer Society, Inc. 2018.

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