Diagnostic guidance

NICE diagnostics guidance on intraoperative tests (RD 100i OSNA system and Metasin test) for detecting sentinel lymph node metastases in breast cancer

THE | COMMISSIONING review

NICE National Institute for Health and Care Excellence

Introduction

NICE issued guidance as part of its diagnostics assessment programme recommending the use of the RD-100i OSNA system for detecting sentinel lymph node metastases in breast cancer in August 2013.[i]

Breast cancer is one of the most common cancers in women in England and Wales with about 46,000 new cases diagnosed and 10,900 deaths recorded each year. Around 1 in 9 women develop breast cancer at some stage in their life.

Diagnostic guidance

Most breast cancers develop in women over 50 years, but they can also occur in younger women and, in rare cases, in men. There are around 260 cases of breast cancer diagnosed and 68 deaths recorded in men in England and Wales each year.

Around 11,000 women with newly diagnosed breast cancer need additional surgery to manage the spread of breast cancer to the lymph nodes every year. In a few people, the tumour has spread significantly within the breast or to other organs of the body at initial diagnosis. Also, some people who have been treated with curative intent subsequently develop either a local recurrence or metastases.

Breast cancer spreads by local spread to nearby tissues, or by regional or distant spread through the circulatory or lymphatic system. Spread through the lymphatic system is the focus of the NICE guidance. It occurs when cancer cells become detached from the main breast tumour and are then usually carried in the lymph to the axillary (armpit) lymph nodes. The first armpit lymph node to which cancer is most likely to spread is known as the sentinel lymph node. Sometimes, there can be more than one sentinel lymph node.

Lymph nodes are often used to stage cancer (measure the extent of the disease) because their function is to monitor lymph, which carries waste products from cells such as bacteria and viruses. Lymph nodes contain various immune system cells, which trigger an immune response if a foreign substance is detected, and so are one of the earliest sites of spread for cancer.

In current NHS clinical practice as outlined in the NICE clinical guideline on the diagnosis and treatment of early and locally advanced breast cancer,[ii] ultrasound evaluation of the axilla (armpit) is done in patients being investigated for early invasive breast cancer. If morphologically abnormal lymph nodes are identified, ultrasound-guided needle sampling is offered preoperatively. For patients who have no evidence of abnormal lymph nodes on ultrasound images or aspiration cytodiagnosis, minimal surgery is performed to stage the axilla during breast surgery to confirm that the cancer has not spread. Sentinel lymph node biopsy, in which the first lymph nodes are removed to see if the cancer has spread from the original site, is the preferred technique. A radioactive solution and a blue dye are injected into the breast before surgery to help identify the sentinel lymph nodes during surgery. These are then biopsied to detect whether the breast cancer has spread.

The fresh biopsy tissue from sentinel

lymph node biopsy is currently analysed using postoperative histopathology. This involves slicing the lymph node into very thin sections. These tissue sections are then stained and viewed by a consultant histopathologist to identify any abnormalities in the tissue. The accuracy of histopathology may vary depending on the number and size of the lymph node sections examined. For example, there is a small risk that histopathological analysis may miss a metastasis because only a few sections of the lymph node are examined, and metastatic foci are not evenly distributed through a lymph node so may not be present in sections that are examined. The results from the biopsy can take up to 15 working days and if the results are positive, the patient will have a second operation to remove the remaining lymph nodes.

For people with breast cancer and their families, waiting to hear if the disease has spread can cause significant distress and anxiety. If the test is positive, and a second operation is needed to remove more of the axillary lymph nodes, the second operation can be technically more difficult and result in a higher risk of complications (because it will involve operating on the

same area of the breast and armpit as the first operation).

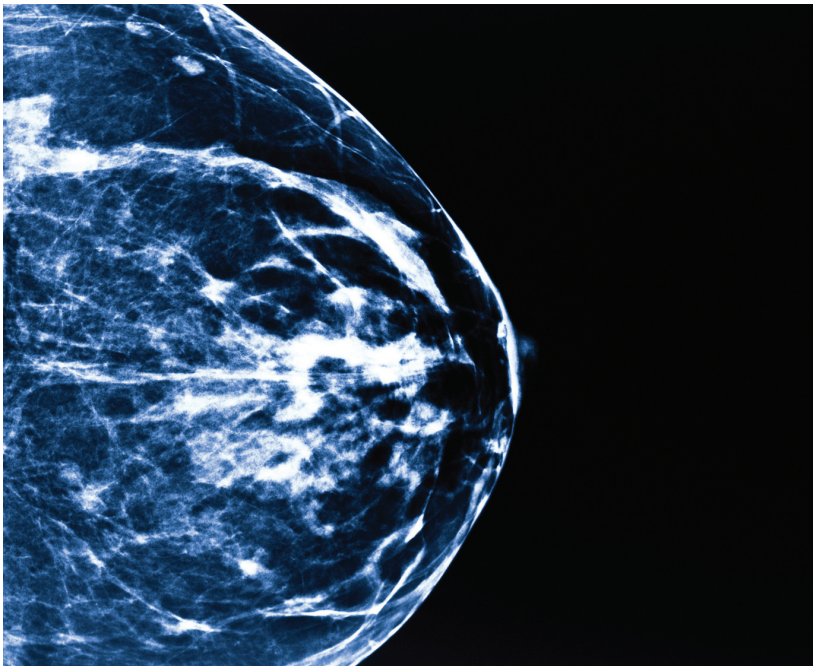
NICE has recommended a new test – the RD-100i OSNA system produced by Sysmex UK – as an option for surgeons to use during operations to discover if breast cancer has spread in people with early invasive breast cancer. The test is used while surgery to remove breast cancer tumours is carried out. It can detect the presence of biological markers that are associated with metastatic spread in sentinel lymph node samples. Using the RD-100i OSNA system will allow test results to be available to the surgical team during the initial operation to help decide if any lymph nodes should be removed at the same time as the initial tumour. This could avoid the need for a second operation and allow subsequent treatments such as chemotherapy to begin earlier. The test can also analyse the whole lymph node and therefore may reduce the risk of a micrometastasis being missed.

The independent Diagnostics Assessment Committee which produced the guidance concluded that analysis of sentinel lymph nodes using the RD-100i OSNA system during operations had considerable advantages over traditional histopathology testing and had the potential to reduce both clinical complications and patient anxiety and distress. The guidance recommends whole-node analysis rather than half-node analysis followed by histopathology because it was found to have more benefit as there is no risk of tissue allocation bias when the whole node was analysed.

The guidance highlights that the use of the RD-100i OSNA system could potentially lead to some disruption to theatre lists, but that this can be overcome with careful planning and scheduling. For example, for the efficient use of intraoperative testing, surgical theatre lists may need to be carefully scheduled and multiple analysers may be needed for sentinel lymph node testing if breast operations occur in parallel. In order to prevent the time in surgery being significantly increased by use of an intraoperative test the sentinel lymph node biopsy can be performed first so that the lymph nodes can be analysed using the RD 100i OSNA system while the primary tumour is being removed.

Also, although fewer sentinel lymph node biopsies may be performed during an operating theatre list to allow time to perform axillary lymph node dissections when the intraoperative test results are positive, theatre time is made available in the subsequent weeks because the patients are not returning for a second operation, which would occur if patients had to wait for postoperative histopathology results. The Committee concluded that any disruption to theatre lists can be overcome with careful planning and scheduling

NICE recommends that a national registry is developed to collect data on the use of the RD-100i OSNA system in detecting sentinel lymph node



metastases during breast cancer surgery. It also recommends that data on all patients having whole lymph node analysis by the RD-100i OSNA system should be submitted to this registry. These data should be integrated with data from other registries for breast cancer where appropriate.

The guidance also considered the Metasin test for detecting sentinel lymph node metastases in people with early invasive breast cancer but does not recommend it in routine clinical NHS practice. Although the test shows promise, the guidance recommends the development of robust evidence to demonstrate its utility in clinical practice.

References

1. National Institute for Health and Care Excellence: Intraoperative tests (RD 100i OSNA system and Metasin test) for detecting sentinel lymph node metastases in breast cancer (diagnostics guidance 8) 2013 http://guidance.nice.org.uk/DG8
2. National Institute for Health and Clinical Excellence: Early and locally advanced breast cancer: Diagnosis and treatment (Clinical guideline 80) 2009. http://guidance.nice.org.uk/CG80

ONE STEP – ONE DECISION

OSNA FOR LYMPH NODE ANALYSIS IN BREAST CANCER

Cost beneficial to the Health Service
Beneficial to the patient

The only intra-operative test for SLN analysis formally recommended by NICE*:

'*Whole lymph node analysis using the RD-100i OSNA system is recommended as an option for detecting sentinel lymph node metastases in people with early invasive breast cancer who have a sentinel lymph node biopsy and in whom axillary lymph node dissection will be considered.*'

'*It is likely that the RD-100i OSNA system is equally or more cost effective than postoperative histopathology.*'

'*Whole node analysis should be fully implemented in local clinical practice to reduce the risk of tissue allocation bias.*'

Enhance patient management and treatment

- Accurate staging supports optimized treatment
- Accurate intra-operative analysis supports One-Step Surgery
- One-Step Surgery supports early access to therapy and reduces patient anxiety

Optimise resources

- Minimise second surgeries and associated technical difficulties
- Optimise theatre management: Treat more patients and reduce waiting lists
- Reduce bed stays
- Reduce Pathology workload: Allows pathologists to focus on other aspects of service provision

* NICE Guidance on 'Intra-operative tests (RD-100i OSNA system and Metasin test) for detecting sentinel lymph node metastases in breast cancer – August 2013'

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