

### What is the significance of DCIS?

Ductal Carcinoma in Situ (DCIS) is a form of non-invasive breast cancer characterised by abnormal proliferation of epithelial cells confined within the mammary ducts. The widespread uptake of mammographic screening has resulted in a large increase in the diagnosis of DCIS. Historically it accounted for 1% of all breast cancers, but DCIS now accounts for 15-20% of cancers diagnosed in screening programs.

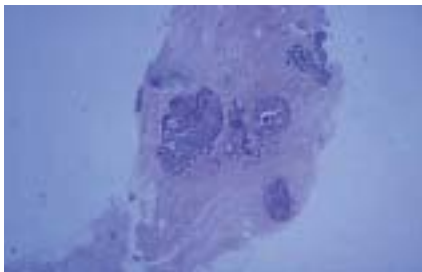
It is estimated that 20-30% of untreated cases of DCIS will progress to invasive breast cancer. Currently it is impossible to distinguish which tumours will progress and which will remain non-invasive, although the risk may be greater when the DCIS is of comedo type or is high grade.

Right: Magnified microcalcifications associated with DCIS.



### Pathology of DCIS

DCIS has various histological forms with differing growth patterns, nuclear morphology and natural history. Although there is currently no agreed classification system for DCIS, those used are based on nuclear grade and architectural patterns. The presence or absence of necrosis, and in particular of comedo type necrosis, is also part of some classifications. In general, most pathologists now categorise DCIS primarily on the nuclear grade and secondarily on the architecture and presence or absence of necrosis. A three-tier system of low, intermediate and high nuclear grade is in general use.



The pathology report provides the surgeon with the following detail:

1. Size - maximum diameter
2. Margins - distance of DCIS from margins of excision
3. Nuclear grade - low, intermediate or high
4. Architecture - solid, cribriform, micro-papillary or papillary
5. Necrosis - either present or absent
6. Calcification - present or absent.

Left: DCIS as seen in a core biopsy.

### Diagnosis of DCIS

DCIS is commonly found at routine screening mammography. Very occasionally it presents as a lump. When calcium is deposited in the abnormal ducts, the area involved appears on the mammogram as an area of calcification - this may be typically linear or "casting" in appearance as it follows the course of the ducts. Frequently however, its appearance is "indeterminate".

#### Investigation:

1. **Fine needle aspiration biopsy (FNAB)** may be undertaken. This is usually done under stereotactic radiological control as the ultrasound is frequently normal. However, the calcifications are often dispersed, making accurate sampling by FNAB impossible. The diagnostic yield is approximately 50%. A negative FNAB should therefore be followed by core biopsy.
2. **Mammotome core biopsy** uses a larger needle under local anaesthetic, and removes tissue cores under radiological control and assisted by suction. This technique allows more accurate diagnosis than FNAB. Invasion may also be demonstrated at core biopsy, although the absence of invasion on core biopsy does not exclude it. **Mammotome core biopsy is the diagnostic modality of choice.** The diagnostic yield is approximately 95%.
3. **Surgical diagnostic biopsy** may be necessary if the results of the fine needle aspiration or core biopsies are unsatisfactory for confident pathological diagnosis, or are inconsistent with the x-ray findings.

## Diagnosis of DCIS (continued)

The lesion is usually impalpable and so must be localised pre-operatively by placing a hook-wire or a carbon track to facilitate surgical removal. Specimen x-ray during anaesthetic is essential to confirm removal of the lesion.

Pathology assessment of the lesion requires 48 hours. Examination by frozen section is inappropriate as it may compromise full assessment of the nature and extent of the tumour and excision margins.

## Treatment of DCIS

The key to successful treatment of DCIS is **complete surgical removal**. In cases where the area of DCIS is small, complete local excision (breast conservation surgery) is adequate. If the area of DCIS has been removed with clear margins of 10mm or more, no further surgery or treatment is usually required.

Not all DCIS contains calcifications and so the extent of DCIS found following surgery may be far greater than that detected at mammography, necessitating further surgery.

A paradoxical twist to DCIS is that although the condition is one of very early breast cancer and is curable by complete excision, total mastectomy is required when the DCIS is extensive. Breast reconstruction is usually offered at the time of mastectomy, unless other treatment such as radiotherapy is required. In this instance, reconstruction can be performed at a later stage.

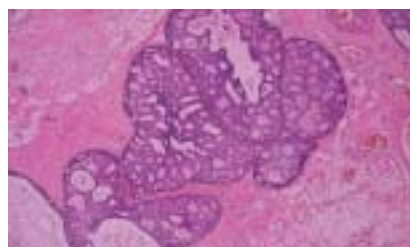
Axillary lymph node dissection is not usually performed in the absence of an invasive component. However, if mastectomy is performed for extensive DCIS, lower axillary sampling may be undertaken, as in one to two percent of such cases a small area of undetected invasive cancer may be present.

## Special issues in the treatment and follow-up of DCIS

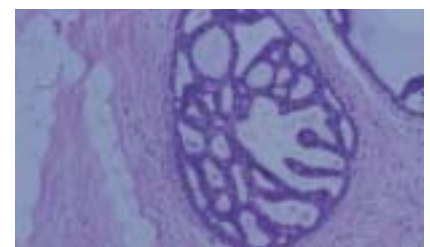
1. **Unsuspected invasive cancer.** The presence of invasive cancer within an area of DCIS cannot always be diagnosed preoperatively. If invasive cancer is found at pathology, further surgery and axillary dissection may be required.
2. **Radiotherapy.** Radiotherapy is used to reduce the chances of recurrence in cases where the DCIS has been fully excised but has narrow margins, when it may be recommended as an alternative to additional surgery.
3. **Systemic adjuvant therapy:**
  - **Tamoxifen.** Women who have had **invasive** cancer may be offered treatment with tamoxifen. This oestrogen-blocking agent has been shown to reduce the incidence of another invasive cancer developing in the same conserved breast or in the opposite breast. There is as yet no convincing evidence that tamoxifen has a similarly significant role in the routine management of **non-invasive cancer (DCIS)** after surgery.
  - **Chemotherapy.** This is not indicated in the treatment of DCIS.
4. **Follow-up.** As there is a risk of recurrence and of further DCIS or invasive cancer in either breast, long term specialist follow-up with annual clinical examinations and diagnostic mammography is required.



Above: DCIS with comedo necrosis.



Above: Cribriform DCIS.



Above: Papillary DCIS.