

(time from first medical consultation to treatment). Prolonged delay usually defined as intervals more than 12 weeks.

**Objective:** The aim of this study was to determine the medical delay and associated factors in the presentation of breast cancer.

**Method:** A total of 198 breast cancer patients were interviewed and the interval between first breast clinic visit and initial treatment was recorded.

The variables examined were age, education, marital status, family history of breast cancer, history of benign breast disease, tumor size and nodal status according to pTNM system.

**Results:** Median and mean of system delay was 1 and 3.44 months respectively and 30 percent of patients had system delay more than three months.

Only age less than 40 years was significantly associated with system delay (OR 2.3, 95%CI 1.26–4.47,  $P=0.007$ ).

**Conclusion:** The findings indicated that system delay in breast cancer care is important weakness in breast cancer management and is seen in almost one third of patients, especially in young women. Therefore, educational programs for physicians and healthcare professionals are recommended.

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### Three-dimensional MR imaging of the breast in supine position using a flexible surface coil: Value in the planning of the breast conserving surgery

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**Background:** MR imaging is becoming a popular modality to diagnose the breast cancer. This modality is especially excellent to evaluate the distribution of cancer therefore it is used for surgical planning before breast conserving therapy. However, it is unable to take the images of the breast in the same position with surgery because patients have to lie in prone position with dedicated breast coil which is not inexpensive equipment. We studied new MR imaging method of the breast in supine position using standard-equipped flexible surface coil.

**Materials and Methods:** 15 patients of the breast cancer before surgery were examined. MR imaging measurements were performed with a 1.5 Tesla MR unit by using a multi-purposed flexible surface coil. The patients were in the same position as the positioning of the breast surgery, in supine, with the arm of the diseased side raised up on the head. The flexible coil was tied around the diseased breast. Three-dimensional gradient spin echo T1 weighted sequence with fat suppression was performed to scan coronal planes of the breast before and after intravenous bolus injection of Gd-DTPA at a dose of 0.2 ml/kg. The images were reconstructed to the three-dimensional view with the method of maximum intensity projection. To evaluate the value of the imaging on planning breast surgery, depictability of the breast cancer and anatomical structures around the breast were assessed.

**Results:** The Breast cancers could be depicted on 14 of 15 cases. On reconstructed 3-dimensional view, outer margin of the major pectoral muscle was depicted in all 15 cases. The axillary fossa in 14 cases, the axillary artery and vein in 13 cases, the dorsal latissimus muscle in 10 cases, the lateral thoracic artery in 14 cases, inner branches of the internal thoracic artery in 9 cases were depicted. No patient complained any pain nor stiffness caused by keeping her position during the MR examination.

**Conclusion:** MR imaging of the breast in supine position is as well able to depict cancers as the imaging in prone position with dedicated breast coil, and can take wider field of views which enables to depict anatomical structures around the breast such as muscle and vessels, in the same position with surgery. Moreover, the coil is less expensive and patients are in more comfortable position than the method in prone with dedicated breast coil. Supine-positioned MR imaging is easy and useful way to examine breast carcinoma on planning the breast conserving surgery.

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### Opportunities of use of biochemical markers for early diagnostics of breast cancer

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**Background:** One of the reasons of high death rate of breast cancer patients is low detectability of disease at early stages. For tumoral pathology is characteristic uncontrollable growth, so, high activity of proliferation. Key enzymes of DNA synthesis on the "Spare" way, sharply changing activity at tumour, Thymidine kinase (TK) and Thymidine phosphorylase (TP). Key enzyme of anaerobic glycolysis – lactatedehydrogenase (LDG). Comparative study of these enzymes activity in healthy women, women with fibrocystic mastopathy (FCM) and with cancer at 1 stage, will help to reveal early changes in DNA metabolism at tumoral pathology.

**Materials and methods:** Blood serum of 60 healthy women, 150 patients with FCM, 25 patients with BC T1N0M0 aged 46–60 years is investigated. Also contents of cyst in women with mastopathy without and with an inflammation and also contents of cyst at BC are investigated. Activity of enzymes was defined spectrophotometrically.

**Results:** TP Activity in blood serum in patients with FCM is authentically reduced up to  $34.8 \pm 2.1$  nmol/min/mg (TP in healthy women –  $43.2 \pm 1.4$  and has the minimal value at FCM with inflammation –  $27.6 \pm 1.9$ ). In contents of cyst at FCM without inflammation TP Activity –  $472.8 \pm 30.0$  nmol/min/mg, with inflammation –  $341.2 \pm 18.0$ . Thus LDG Activity in blood serum in patients with FCM sharply increases up to  $33.1 \pm 3.5$  nmol/min/mg (norm –  $2.1 \pm 0.6$ ) and increased with severity of disease. TK Activity in patients with mastopathy did not change, at T1N0M0 increased up to  $3.82 \pm 0.1$  nmol/min/mg (in norm –  $3.14 \pm 0.55$ ). Thus TP Activity –  $18.0 \pm 1.2$  nmol/min/mg. Even slight increase of TK on a background of decrease of TP creates conditions for intensive proliferation which can use energy of anaerobic glycolysis. Activity of LDG at BC T1N0M0 grows in 3 times –  $65.8 \pm 0.5$  nmol/min/mg.

**Conclusions:** Thus, at fibrocystic mastopathy TP activity is reduced, that creates conditions for increase of DNA activity synthesis, accompanied by amplification of energetic maintenance. At initial stages of disease (T1N0M0) TK activity increases, that can be one of the reasons of activation of neoplastic transformations. Therefore, if at inspection of patients with FCM, especially accompanying the inflammation, at definition of TK, TP and LDG observes increase of TK activity and LDG on a background of decrease in TP activity is possible to assume presence of tumoral disease at his early stages.

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### Mammary ductoscopy in human mastectomy specimens: the feasibility and limitations

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**Background:** With the recent advances in the development of newer generation of micro endoscopes, Mammary Ductoscopy is gaining popularity. This technique has made it possible to visualise the mammary ductal system and ductal lavage under direct vision using a submillimetre microendoscope passed through a ductal opening on the nipple's surface.

**Objectives:** The purpose of this study was to assess the feasibility of this procedure to successfully cannulate the mammary ducts and to assess and visualize mammary ductal lesions.

**Materials & Methods:** Ten mastectomy specimens were included in the study from patients undergoing mastectomy for breast cancer. The tumour bearing quadrant was massaged until nipple discharge was obtained. Lacrimal duct probe was then used to dilate the nipple orifices and proximal ducts. Subsequently, Nipplescope (Lifeline Biotechnologies, USA) was used for ductoscopy. Normal saline was used for irrigation through a side attachment.

**Results:** Out of 10 specimens mammary ductoscopy was accomplished in 8 (80%). Only 2 cases (20%) had unsuccessful cannulation. One case (aged 73 years) had nipple sclerosis and hence was impossible to cannulate. The second case had dye injected prior to surgery into the duct and hence despite repeated irrigation it was not possible to visualise the ductal system due to the dye. Ductal pathology was visualised in 7 (87.5%) out of the 8 cases. It was possible to navigate the ductoscope up to a depth of 10 cm (range 0–10 cm).

**Conclusions:** Mammary Ductoscopy is technically feasible in most patients and has a potential in breast cancer detection.

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### Additional diagnostic analysis for a palpable breast lesion: triple test and or histological core needle biopsy

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**Purpose:** Next to physical examination of the breasts, the evaluation of a palpable breast lesion can be extended by imaging, fine needle aspiration cytology (triple test) and/or a histological core needle biopsy. Purpose of this study was to evaluate the diagnostic performance of these additional diagnostic tests.

**Materials and methods:** During 10 months 2020 consecutive patients referred for mammography were prospectively followed during their diagnostic assessment. Suspected palpable lesions underwent a

fine needle aspiration as part of the triple diagnostic procedure. Non-conclusive or non-representative triple test results were reason to perform a histological core needle biopsy. Malignant lesions, non-conclusive and non-representative histology of the core needle biopsy and suspected lesions, that did not undergo one of the previous diagnostic procedures underwent an excisional biopsy. This excisional biopsy and 1 year follow up was used as standard for reference.

The performance of the diagnostic modalities were described in an inconclusive rate, sensitivity and specificity, and area under the receiver operating characteristic curve.

**Results:** From October 1999 till August 2000, 2020 patients underwent physical examination of the breasts and imaging. In 271 suspicious palpable breast lesions additional diagnostic procedures were indicated. Fine needle aspiration was performed in 241 lesions. Histological core needle biopsy was performed in 70 cases. 191 palpable breast lesions were surgically excised. See Table 1.

**Conclusion:** The diagnostic performance of the histological core needle biopsy as a less invasive diagnostic modality seems better compared to the triple diagnostic procedure, including fine needle aspiration cytology. Whether we should abandon the triple diagnostic procedure all together is uncertain. Probably there is some place for better-defined indications about the previous diagnostic results and some characteristics of the lesion about palpability.

Table 1

	Inadequate rate	Sensitivity	Specificity	AUC-ROC
Fine needle aspiration cytology	0.12	0.81	0.74	0.95
Triple test	0.20	0.85	0.12	0.76
Histological core needle biopsy	0.06	0.95	0.87	0.95
Diagnostic excision	0.00	1.00	1.00	1.00

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#### Impact of introducing a preoperative vacuum assisted biopsy on the surgical outcome of suspicious microcalcifications

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**Purpose:** To evaluate whether a preoperative vacuum assisted biopsy (VAB) for suspicious microcalcifications reduces open biopsies for benign lesions and reduces the re-excision rate.

**Materials and methods:** Retrospectively the results of surgical procedures after preoperative localisations of 1998 and of 2001 were reviewed and compared. In 2001 VAB was introduced in the evaluation of non-palpable clusters of microcalcifications.

**Results:** In 2001, 213 lesions and in 1998, 146 lesions needed a preoperative localisation. 23% (50 of the 213 lesions) were clusters of microcalcifications in 2001 and 50% (73 of the 146 lesions) in 1998.

Only 22% (11 of the 50 clusters) showed benign histology after excision where this was 49% (36 of the 73 clusters) in 1998. Of these 11 clusters, 5 clusters were proliferative fibrocystic lesions (radial scar and atypical hyperplasia).

Of the malignant (39 of the 50) clusters of microcalcifications, 67% had a VAB prior to surgery. 5 patients needed a re-excision (4 mastectomies, and 1 axillary dissection).

Comparing with 1998, there was an important decrease in the re-excision rate (from 22% to 12%), where re-excision was more frequent when no biopsy was done preoperatively.

**Conclusion:** The introduction of VAB reduces the number of surgical procedures for benign cluster of microcalcifications and facilitates one-step surgery.

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#### Review of lymphomas diagnosed in a Breast Unit

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**Background:** A pathological result of lymphoma is almost always an unexpected result in a Breast Unit. Our purpose is to study the clinical aspects of lymphomas diagnosed in our Breast Unit.

**Material and methods:** We have included 2651 patients who had a diagnosis of malignancy in our Breast Unit between January 1995 and July 2003 and who were included in the Unit computer database. We have found patients who have had a pathological result of lymphoma and we have performed a retrospective study using their case-histories.

**Results:** Ten patients had a pathological result of lymphoma and represent 0.38% of cases with a malignant diagnosis. Nine patients consulted us because of clinical or radiographic breast abnormalities, with or without axillary adenopathies, and one patient consulted because of axillary nodes without breast pathology. The ages range from 22 to 87.

Three cases were primary breast lymphomas (B-cells) and one more (T-cells), who was diagnosed in terminal stage, probably also was one of former (in total, 0.15% of total malignant breast pathology). Two of them had antibodies against hepatitis C virus and one against HIV. A fifth case with a lymphoma localised in the breast had a mammary recurrence of a B-cell lymphoma treated in another centre. The mammographic findings in these cases varied from benign features to a high suspicion of malignity. The diagnosis was performed by a surgical biopsy in one case, by a core biopsy in three cases and a punch in the last one. There was no need of axillary biopsy.

The other five cases were extramammary lymphomas: four B-cell lymphomas with mammography with benign findings, and one Hodgkin's disease with a clinical presentation and radiographic features compatible with an inflammatory breast cancer, having breast swelling without a dominant mass and axillary and supraclavicular adenopathies. Four patients had a negative breast biopsy and we needed a surgical axillary biopsy in three cases.

**Conclusions:** Primary breast lymphoma is an uncommon lesion and can present diverse mammographic images, from benign features to high-suspicion lesions. We must not forget the possibility of an extramammary lymphoma when the patient has axillary adenopathies without evidence of a breast lesion. We do not always need an open biopsy to make the diagnosis. We must be aware of the possibility of a lymphoma in patients with antibodies against HIV and to perform an accurate control and follow-up.

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#### How often unsuspected cytologically nipple discharge is a symptom of underlying breast cancer

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**Background:** Nipple discharge is can be caused by benign diseases of the breast, but also may be a symptom of an underlying breast cancer. Fear that nipple discharge might be a symptom of underlying cancer is the main issue motivating patients and their physicians to treat this disorder surgically.

**Objective:** To assess the rate of false negative results of cytologic examination of nipple discharge in patients qualified to surgical treatment.

**Material and methods:** From 1977 to 2002, 414 women were operated on for nipple discharge in our Department. The study group was composed of 234 women, in whom no palpable tumor was identified on palpation, no cancer or suspected cells were identified on cytologic examination of the nipple discharge. In 177 of them discharge was unilateral and in 57 was bilateral. Altogether 291 occurrences were analysed. We evaluated the incidence of cancer diagnosed on pathological examination of the excised breast tissue in these patients.

**Results:** Breast cancer was diagnosed in 4 cases. Therefore the results of cytologic examination of nipple discharge were false-negative in 1.4% of cases (4/291). In all these cases the character of nipple discharge was described as bloody.

**Conclusions:** The rate of false-negative results of cytologic examination of nipple discharge is very low. Therefore there is no necessity to treat surgically all such patients in order to verify the possibility that the discharge is caused by underlying cancer. Further diagnostic work-up should be undertaken in such patients.

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#### The contribution of intraoperative cytology in the diagnosis of hyperplastic lesions of the breast

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**Background:** To report the incidence of the hyperplastic lesions in benign and malignant breast tumors, as well as to evaluate the contribution of the intraoperative imprint cytology in the diagnosis of hyperplastic breast lesions.

**Material and Methods:** 486 biopsy specimens from breast cancer patients who underwent surgical treatment were evaluated. Intraoperative