Virchows Arch (2000) 437:354–359

ORIGINAL ARTICLE

D. Faverly · F. Renard · M. Drijkoningen
R. Scheiden

Breast cancer screening pathology: an assessment of the practise and needs in Belgium and Luxembourg

Received: 31 March 2000 / Accepted: 9 May 2000

Abstract Education and quality assurance (QA) in breast screening pathology have been encouraged by the Europe Against Cancer programme. As a prerequisite for the set-up of a QA programme in Belgium and in the Grand Duchy of Luxembourg, an inquiry was initiated to evaluate the daily practise in breast pathology, the modalities in handling and analysing breast specimens and the willingness of the pathologists to participate in a QA scheme. Of the 278 mailed questionnaires, 109 confidential and valid questionnaires were returned, meaning a participation rate of 40%. All 109 respondents indicated their willingness to voluntarily participate in the further QA programme. Segmental resections for conservative surgery and excision biopsies ranked first and second, respectively, in examination requests. Of the respondents, 50% complained about the lack of clinical information on the pathology request form. A multidisciplinary team approach for the diagnosis of screen-detected lesions was deemed desirable by 87% of the respondents, but only 16% of them actually participate in such pre-operative meetings. Even more puzzling is that 75% of the respondents report regular unavailability of the control radiogram of the surgical specimen removed for non-palpable lesions. One-quarter to one-third of the pathologists still regularly perform frozen sections on microcalcifications or tumours smaller than 1 cm. However, 81% of the respondents estimate that pre-operative diagnosis is not appropriate for this type of lesion. The results of this inquiry show that the guidelines for the diagnosis of screen-detected breast lesions are not yet fully applied in daily practise. The development of local comprehensive breast teams involving a pathologist should improve the co-ordination between the medical disciplines, represent an important way of disseminating the guidelines on breast screening pathology and stimulate the relay unit to conduct QA programmes.

Keywords Pathology · Breast cancer screening · Quality assurance · Specimen handling · Guidelines

D. Faverly (✉)
Centre de Morphologie Pathologique,
45A Avenue Wybran, 1050 Brussels, Belgium
e-mail: cmp.faverly@pophost.eunet.be
Tel.: +32-2-5243384
Fax: +32-2-5243645

D. Faverly · F. Renard
Centre de Référence pour le Dépistage du Cancer du Sein,
1030 Brussels, Belgium

M. Drijkoningen
Department of Pathology and Leuvens Universitair Centrum voor Kankerpreventie, University Hospital St Rafaël,
Katholieke Universiteit Leuven, 3000 Leuven, Belgium

R. Scheiden
Laboratoire National de Santé,
Division d'Anatomie-pathologique, 1950 Luxembourg,
Grand Duchy of Luxembourg

Introduction

With the implementation of mammographic screening, pathologists are facing new challenges. The success of a breast cancer screening programme depends in particular on the quality of the pathological assessment of biopsies and surgical specimens. However, the daily work of the pathologist involved in breast tissue analysis has been deeply modified and requires new skills. Most biopsies of mammographic abnormalities concern small-size, non-palpable lesions. The type of pathologic lesions has also changed, with increasing frequency of problematic differential diagnoses and entities of unpredictable behaviour. Diagnosis requires detailed examination and correlation with medical imaging data. Assessment and treatment of such lesions are the result of a multidisciplinary process in which the pathologist definitely plays a role. The programme Europe Against Cancer has issued quality assurance (QA) guidelines for the disciplines involved in breast cancer screening [6]. In the field of pathology, these guidelines were largely based on earlier recommendations applied in the United Kingdom [7] before the implementation of the European Community (EC) Working Group for Breast Screening

Pathology. In Belgium, some pilot projects have set up organised screening, and the Flemish government recently decided to progressively extend breast cancer screening to the whole Flemish region [18]. In the French community, a QA project is being developed [1], but no organised programme extending invitations to women has yet begun. Since 1992, the national "Programme Mammographie" has been successfully set up in the Grand Duchy of Luxembourg [17].

The development of QA will enable assessment of the performance and needs of breast pathology, stimulate contacts among the different disciplines and diffuse QA guidelines [6]. The two Belgian centres supported by the Europe Against Cancer programme in the field of breast cancer screening, the "Centre de référence pour le dépistage du cancer du sein" (CRDCS) from Brussels and the "Leuvens Universitair Centrum voor Kankerpreventie" (LUCK) from Leuven, collaborated with the National Health Laboratory from Luxembourg to conduct an inquiry on the practise of breast pathology in both countries. The first objective of the project was to evaluate the state of affairs in breast specimen analysis and to approach pathologists involved and interested in that particular field. The second aim was to disseminate guidelines, to introduce the concept of QA in breast pathology and to propose participation in further steps of implementation of a QA programme.

Materials and methods

Study forms were sent to 271 Belgian and 7 Luxembourg pathologists filed in the index of the Professional Association of Pathologists in Belgium (GBS-VBS) and in the National Health Laboratory in Luxembourg, respectively. Apart from the study form, the mailing included an explanatory introduction letter and a copy of the European Guidelines for QA in Mammography Screening Pathology [2, 15]. The study form was composed of two distinct parts: an anonymous questionnaire relating to the professional practise and an identification form to return in a separate envelope to identify pathologists willing to participate in further steps of the QA programme. The questionnaire addressed the following points: demographic profile of respondents, frequency of breast tissue analysis in general practise, quality of clinical information relating to the patient, particular steps in the handling of breast specimens, computerised registration and opinion on the European Guidelines for QA in Mammography Screening Pathology. A multilingual version of the questionnaire can be obtained at the following internet address: www.breastpathology.org. Study forms were mailed on 5 January 1998 and collected within a month by two registration centres (CRDCS was responsible for registration of forms from the French-speaking pathologists and LUCK for those of the Dutch-speaking participants). Data were then pooled and analysed using SPSS software.

Results

Of the 278 mailed questionnaires, 131 were returned (47%). Twenty-two forms have been excluded because of insufficient data, leaving 109 questionnaires to be analysed. All those 109 respondents indicated their willingness to participate in the QA programme.

Profile of respondents

Of the respondents, 48% practise mostly in Flanders, 25% in Wallonia, 21% in Brussels and 6% in Luxembourg. The proportion of French- and Dutch-speaking pathologists is identical. Of the respondents, 37% are younger than 41 years, 42% are aged between 41 years and 50 years and 21% are older than 50 years. Seventy-two percent practise in a non-academic environment, while 28% practise in a purely academic (10%) or mixed (18%) environments. However, this distribution varies strongly between regions, and the participation of pathologists practising in university hospitals is higher in Brussels (61%) than in Wallonia (26%) or in Flanders (16%). All Luxembourg participants practise in a non-academic environment. Hospital-based practise is reported by 85% of the respondents and does not show any difference between regions. Only one-third of the respondents have local access to a colleague specialised in breast pathology, and 39% benefited from specific training. These rates are higher among respondents from Brussels and Luxembourg than from Wallonia or Flanders.

Frequency of pathologic analysis and type of breast tissue sample

Most respondents (61%) perform between two and four analyses of breast tissue a week, and 20% more perform it at least once a day (Table 1). Segmental excision for conservative surgery and open or localisation biopsies ranked first and second in examination requests, respectively, since 45% and 39% of participants indicated they analyse that type of specimens at least twice a week, respectively. Pathologic examination of mastectomy specimens is performed at least twice a week by only 29% of respondents. Needle core biopsy (NCB) is quite uncommon, with 74% of the participants receiving NCB not even once a week (answers "3 or less monthly", "never" considered together).

Pathology analysis request forms and multidisciplinary team approach

One-half of the respondents (Table 2) regularly receive examination request forms not correctly completed (answers "half of the cases", "sometimes", "never" considered together). Almost 40% of the participants report that on at least half of the request forms, the side origin of the sample (left or right breast) is not referred to. The circumstances of the detection of the lesion (screen-detected or not) and the purpose of surgery (e.g. diagnostic biopsy, breast conservative surgery) are even less frequently indicated.

Although 87% of the respondents wish to participate in diagnosis and therapeutic meetings with clinicians and radiologists, effective participation of pathologists in

Table 1 Frequency of pathologic analysis and types of breast tissue sample

Frequency	Needle core biopsy	Surgical biopsy[a]	Segmental excision[a]	Mastectomy[a]
One and more daily	1 (1%)	5 (5%)	4 (4%)	2 (2%)
2–4 Weekly	12 (11%)	37 (34%)	44 (41%)	29 (27%)
One weekly	15 (14%)	35 (33%)	27 (25%)	29 (27%)
Three or less monthly	55 (51%)	20 (19%)	24 (23%)	40 (37%)
Never	25 (23%)	10 (9%)	7 (7%)	8 (7%)
Total number of answers (%)*	108 (99%)	107 (98%)	106 (97%)	108 (99%)

[a] Terms defined according to European guidelines for quality assurance in mammography screening pathology [6]. Surgical biopsy: open or localisation biopsies
* Number of answers to the question versus the number of participants (*n*=109). Pathologic examinations of segmental excision, surgical biopsy and mastectomy specimens are performed at least twice per week by 45%, 39% and 29% of respondents, respectively (answers "one and more daily", "2–4 weekly" considered together)

Table 2 Information provided by the clinician on the pathology request form

Frequency	Forms correctly filled out	Side origin of sample	Screen-detected lesion	Purpose of surgery
Always	7 (7%)	12 (12%)	3 (3%)	11 (11%)
Often[a]	44 (43%)	51 (49%)	25 (24%)	27 (26%)
Half of the cases	16 (15%)	29 (28%)	13 (13%)	12 (12%)
Sometimes[a]	33 (32%)	10 (10%)	49 (48%)	34 (33%)
Never	3 (3%)	1 (1%)	12 (12%)	19 (18%)
Total number of answers (%)*	103 (94%)	103 (94%)	102 (94%)	103 (94%)

[a] Often was defined as "at least in 60% of the cases" and sometimes as "in 40% of the cases or less"
* Number of answers to the question versus the number of participants (*n*=109). The side origin of the sample (left or right breast), the circumstances of the detection of the lesion and the purpose of the surgical excision are not regularly specified on the analysis request form in 39%, 73% and 63% of the cases, respectively (answers "half of the cases", "sometimes", "never" considered together)

Table 3 Participation in diagnostic and therapeutic multidisciplinary meeting

	Pre-operative[a]	Post-operative[a]	Pathologist required[a]
Yes	17 (16%)	35 (34%)	90 (87%)
No	87 (84%)	69 (66%)	13 (13%)
Total number of answers (%)*	104(95%)	104(95%)	103(95%)

[a] Pre-operative refers to the question, "Do you take part in pre-surgery patient discussions on a regular basis?". Post-operative refers to the question, "Do you take part in post-surgery patient discussions on a regular basis?". Pathologist required refers to "Do you consider the presence of a pathologist at these discussions mandatory?"
* Number of answers to the question versus the number of participants (*n*=109)

Table 4 Management of biopsy and excision specimens for minimal breast lesions

Frequency	Orientation of specimen	Specimen radiograph	Painting of specimen
Always	13 (13%)	7 (7%)	53 (53%)
Often[a]	39 (38%)	18 (18%)	28 (28%)
Half of the cases	14 (14%)	10 (10%)	0
Sometimes[a]	31 (31%)	39 (38%)	14 (14%)
Never	4 (4%)	27 (27%)	5 (5%)
Total number of answers (%)*	103(95%)	101(93%)	100(92%)

[a] Often was defined as "at least in 60% of the cases". Sometimes was defined as "in 40% of the cases or less"
* Number of answers to the question versus the number of participants (*n*=109). The absence of orientation guide marks and of specimen X-ray is reported by 49% and 75% of respondents, respectively. (answers "half of the cases", "sometimes", "never" considered together). Pathologists (81%) answered that they regularly ink the surface of the specimen (answers "always", "often" considered together)

such case discussions is only reported by 16% and 34% of respondents, respectively, for pre- and post-operative meetings (Table 3). All 35 pathologists already taking part in such meetings consider this useful, except one. The lack of a multidisciplinary approach is equally distributed within age groups, regions and type of practise, but pathologists who have benefited from a specific training are three times more likely than others to attend those case discussion meetings.

Practical modalities of pathologic analysis of specimens for minimal lesions

Surgical specimens are often not sufficiently documented (Table 4). Almost 50% of participants deplore the absence of guide marks on surgical biopsies, hampering the

Table 5 Frozen sections (FSs) on biopsy and excision specimen for minimal breast lesions

Frequency	Microcalcifications	Tumour smaller than 1 cm	Excision margins	Is FS request justified?
Always	1 (1%)	6 (6%)	5 (5%)	3 (3%)
Often[a]	16 (16%)	31 (31%)	19 (19%)	9 (9%)
Half of the cases	8 (8%)	6 (6%)	2 (2%)	7 (7%)
Sometimes[a]	46 (45%)	48 (47%)	37 (36%)	54 (55%)
Never	30 (30%)	10 (10%)	38 (38%)	25 (26%)
Total number of answers (%)*	101 (93%)	101 (93%)	101 (93%)	98 (90%)

[a] Often was defined as "at least in 60% of the cases". Sometimes was defined as "in 40% of the cases or less"
* Number of answers to the question versus the number of participants (n=109). Pre-operative FSs are regularly performed on microcalcifications, tumours smaller than 1 cm and excision margins by 25%, 43% and 26% of respondents, respectively. In addition, 19% of respondents consider FS requests to usually be appropriate in those indications (answers "always", "often", "half of cases" considered together)

topographic orientation of the specimen to the breast (answers "half of the cases", "sometimes", "never" considered together). Even more puzzling is that 75% of participants report regular unavailability of specimen X-rays in case of surgical resection for non-palpable lesions. The same proportion of respondents mention the absence of the biopsy control radiogram of NCBs sampled for microcalcifications. Pathologists working in an academic environment are two times more likely to dispose of those specimens' radiograms than non-academic pathologists. Luxembourg represents an exception to this rule; the pathologists systematically received all hooked-wire-directed biopsies accompanied with a copy of the specimen X-ray.

Painting the surface of the specimen with Indian ink at the time of gross examination is commonly reported by 81% of participants (answers "always", "often" considered together) and 53% perform it systematically.

Frozen sections

Rapid frozen sections (FSs) for pre-operative diagnostic purpose are not performed on a regular basis in case of biopsy for minimal lesions (Table 5). Nevertheless, one quarter of the participants still practise FS on microcalcifications and excision margins, and 43% still practise on tumours smaller than 1 cm (answers "in half of the cases", "often", "always" considered together). Fewer pathologists (19%, answers "in half of the cases", "often", "always" considered together) feel FS requests are justified in those indications. Oddly, answers on this topic are not influenced by the respondent's age, the region and type of activity or participation in a specific training.

Codification and transmission of data to a cancer register

Most laboratories dispose of a computerised registration and codification system of the pathology reports. There is nevertheless a high variability in codes used. The Leiden's code (Dr M. Drijkoningen, University Hospital St Rafaël, Leuven) and those derived from that are the most frequently used (45% of respondents), mainly in the Flemish region. Both the official systemised nomenclature of medicine (SNOMED) code [5] and "personal codes" arrive on equal terms in second position with 20% of users. The remaining laboratories (15%) use other official codes (ICDO, ICD9, SNOP, HCIMO).

For the Belgian participants, the principle of data transmission toward a breast cancer or biopsies register is accepted by 94% of respondents, provided confidentiality of data and restricted use to medical scientific purpose is guaranteed. In Luxembourg, the National Health Laboratory is in charge of both the routine diagnostic pathology and the compilation of the cancer cases in the Morphologic Tumor Register [4].

European guidelines for QA in mammography screening pathology

The European guidelines were favourably accepted since 99% of respondents judged the document useful and 45% of participants, already knew the guidelines before the inquiry. The document was better known in the French community, most likely because of its publication in the *Annales de Pathologie* [2].

Discussion

The participation rate was rather high for a mailing study with 40% valid questionnaires. However, we have no idea of the reasons for non-participation. Therefore, we cannot extrapolate the sample of respondents to the whole population of pathologists. No data bank describing the demographic or professional situation of the population of Belgian pathologists exists. Therefore, a possible selection bias cannot be excluded. Furthermore, the results of the inquiry are not based on objective data but on the subjective assessment of the pathologists. This is not a problem because our aim was to approach patholo-

gists involved and interested in breast diseases and to identify trends and needs in daily practise. In this perspective, we think we have reached our objective better than expected. The significant rate of participation and the voluntary willingness of the respondents to take part in further steps of the project are an encouragement for the effort to implement a QA programme.

Mammographic breast cancer screening has increased the number of biopsies for non-palpable lesions and contributes to the success of conservative surgery [8, 11]. Despite the absence of fully developed, organised breast cancer screening in Belgium, the pathologists participating in the study report that segmental excisions or open biopsies are more common than mastectomy specimens. This is probably also due to the evolution of surgical practise towards less mutilating treatment modalities. The management of surgical specimens removed for mammographically detected lesions has been the subject of various guidelines [7, 13, 15, 19, 20], all emphasising the necessity of a co-ordinated radio-morphologic diagnostic procedure. In the present study, 75% of participants report unavailability of the specimen radiography, which may hamper the identification and the diagnosis of the lesion. This matter of concern attests, at the very least, to the lack of information of the other medical disciplines on the imperatives of pathologic analysis. Another point of concern that may lead to practical repercussion on the work of the pathologist is the insufficiently filled out examination request form. The mammographic detection of a lesion and a therapeutic option for conservative surgery are both critical indications for a detailed, meticulous morphologic examination and are very seldom specified on the analysis request. The use of a check list or of specific preformatted request forms could probably help, but the first step should be informing the clinicians in order to make them more aware of the usefulness of some key data.

Dissemination of the guidelines and their acceptance is of course an important starting point to improve the collaboration between disciplines. The European guidelines were judged useful by 99% of the participating pathologists, which is encouraging. Nevertheless, the acceptance of the recommendations only makes sense if followed by their application in routine practise. The inquiry seems to indicate such trends: the routine inking of the surface of the specimens and the less systematic assessment of microcalcifications and excision margins with FSs, are reported by 75% and 74% (Table 5; answers “sometimes”, “never” considered together) of the respondents, respectively. Several authors [7, 10, 15, 20] advise against pre-operative FS diagnosis of clinically impalpable lesions. The small size and the inconspicuous gross aspect of screen-detected lesions may be the source of sampling errors leading to false-negative diagnoses [12]. However, the major disadvantage of routine FS examination is the distinct possibility of damaging a critical zone of diagnostic value.

A controversial point is the minimal size of a tumour that contraindicates FS. Some authors consider FS definitely inappropriate in cases of soft tissue densities or tumours measuring less than 0.5 cm [20]. For others, the cut-off is 1 cm [15]. These differences of opinion could, at least partially, explain the relatively high number of pathologists (43%) in our study still performing FSs on tumours smaller than 1 cm, as indicated in the comments of the inquiry by some of the participants. In the absence of a consensus, it should be kept in mind that the tumour should be large enough to leave an adequate portion unfrozen for permanent sections. Another explanation for these persisting practise is the insistence of clinical request for FS. Indeed, 81% of the respondents consider the demands for FSs unjustified, but 43% continue to perform FS on minimal tumours, leading to the supposition that in some cases FS was done against the opinion of the pathologist.

Clinical demands for FS are also related to the quality and the results of the pre-operative setting. Image guided fine needle aspiration and NCB have become established diagnostic procedures for screen-detected abnormalities [3, 14]. There has been much attention on the advantages and drawbacks of both methods, but NCB allows for the differential diagnosis between in situ and invasive tumours and can be subjected to a control procedure to determine the adequacy of the sample. NCB was quite uncommon in our study, with 74% of the respondents not even receiving one once a week. A wider use of NCB of minimal breast lesions would probably decrease the frequency of FS requests. Nevertheless, performing image guided NCB on screen-detected abnormalities requires complex and expensive equipment and a highly skilled medical team, which limits the dissemination of the technique.

The integration of the pathologist in a multidisciplinary case discussion is highly recommended [7, 15] and was deemed desirable by 87% of the respondents, but unfortunately does not correspond to reality. The effective participation of pathologists in pre- and post-operative meetings is reported respectively by 16% and 34% of the respondents. The aim of these multidisciplinary meetings is to discuss the clinical, radiological and cytopathological findings and to reach a consensus on the practical modalities of the diagnosis procedures and the management of each patient.

Most of the weak points highlighted by this study were caused by a lack of communication and understanding between the pathologists and the other medical disciplines. In our opinion, the development of comprehensive breast teams in hospitals or other relay institutions should allow for a better co-ordination between the medical specialities and optimisation of patient management.

The results of the present study have led the foundation for further implementation of a QA programme in Belgium and Luxembourg:

– A specific training for pathologists in the field of screen-detected lesions seems indicated. This could take place in a permanent training process based on slide exchange [16].

– The National or Community reference centres should stimulate the implementation of local comprehensive breast groups. In 1997, the CRDCS organised on-site multidisciplinary courses aimed at pathologists, radiologists and clinicians from the same hospital or institution. This experience could be repeated and extended on a larger scale.
– The pathology guidelines and the results of this inquiry should be diffused to non-pathologists. A specific session on breast screening pathology could be incorporated in the permanent training process of radiologists and clinicians.
– A standardisation of the pathology diagnoses codification systems should precede any collaboration with the Belgian National Cancer Registry [9].

Acknowledgements We are indebted to the pathologists who contributed to the inquiry and to the following persons for their valuable assistance in the realisation of the study: Kristina Cannoodt, Karla Vanhulle, Michel Candeur (questionnaire formatting, computing and secretariat); Johan Schouten and Anne Vandenbroucke (manuscript review); Bernard Vandenheule (GBS-VBS), Marie-Christine Wagnon and Astrid Scharpantgen (Programme Mammographie Luxembourg; Georges Lens [web master (www.breastpathology.org)]. This work has been funded by Europe Against Cancer, the "Centre de référence pour le dépistage du cancer du sein" (CRDCS), the Belgian Cancer Association, the "Communauté Française de Belgique" and the "Leuvens Universitair Centrum voor Kankerpreventie" (LUCK), Belgium.

References

1. Autier P, Vandenbroucke A, Grivegnée A, Faverly D, Pas L (1994) Le dépistage du cancer du sein en Belgique: quelle qualité à quel prix? Cahier de l'IBES (Institut Belge de l'Economie de la Santé) 5:26–28
2. Bellocq JP, Faverly D, Jacquemier J, Zafrani B, Chenard MP (1996) Recommandations européennes pour l'assurance de qualité dans le cadre du dépistage mammographique du cancer du sein. Ann Pathol 16:315–333
3. Caines JS, Chantziantoniou K, Wright BA, Konok GP, Iles SE, Bodurtha A, Zayid I, Daniels C (1996) Nova Scotia Breast Screening Program experience: use of needle core biopsy in the diagnosis of screening-detected abnormalities. Radiology 198:125–130
4. Capesius C, Scheiden R, Groff P, Kanz R, Juchem JP, Wehenkel CI (1998) Nouveaux cas de cancer au Luxembourg. Monographie de l'année 1996. Registre Morphologique des Tumeurs au Grand-Duché de Luxembourg (ed), Luxembourg
5. College of American Pathologists (eds) (1990) SNOMED II: the systematized nomenclature of Medicine
6. De Wolf CJM, Perry NM (eds) (1996) European guidelines for quality assurance in mammography screening. Office for Official Publications of the European Communities, Luxembourg
7. Elston C, Ellis I (1990) Pathology and breast screening. Histopathology 16:109–118
8. Fracheboud J, de Koning HJ, Beemsterboer PM, Boer R, Hendriks JH, Verbeek AL, van Ineveld BM, de bruyn AE, van der Maas PJ (1998) Nation-wide breast cancer screening in The Netherlands: results of initial and subsequent screening 1990–1995. National evaluation team for breast cancer screening. Int J Cancer 75:694–698
9. Haelterman M (ed) (1999) Cancer in Belgium 1993–1995. National Cancer Registry, Brussels
10. Lee AHS, Ellis IO, Pinder SE, Barbera D, Elston CW (2000) Pathological assessment of sentinel lymph-node biopsies in patients with breast cancer. Virchows Arch 436:97–101
11. Moritz S, Bates T, Henderson SM, Humphreys S, Michell MJ (1997) Variation in management of small invasive breast cancers detected on screening in former south east Thames region: observational study. BMJ 315:1266–1272
12. Niemann TH, Lucas JG, Marsh WL (1996) To freeze or not to freeze. A comparison of methods for the handling of breast biopsies with no palpable abnormality. Am J Clin Pathol 106: 225–228
13. Rosen PP (1996) Pathological examination of breast specimens. In: Rosen PP (ed) Rosen's breast pathology. Lippincott-Raven, Philadelphia, New York, pp 837–861
14. Rosen PP (ed) (1999) Breast pathology. Diagnosis by needle core biopsy. Lippincott, Williams and Wilkins, Philadelphia
15. Sloane JP (1996) Quality assurance guidelines for pathology in mammography screening. In: De Wolf CJ, Perry NM (ed) European guidelines for quality assurance in mammography screening. Office for Official Publications of the European Communities, Luxembourg, pp IIC 1–31
16. Sloane JP, Amendoeira I, Apostolikas N, Bellocq JP, Bianchi S, Boecker W, Bussolati G, Coleman D, Connolly CE, Eusebi V, De Miguel C, Dervan P, Drijkoningen R, Elston CW, Faverly D, Gad A, Jacquemier J, Lacerda M, Martiinez-Penuela J, Munt C, Peterse JL, Rank F, Sylvan M, Tsakraklides V, Zafrani B (1999) Consistency achieved by 23 European pathologists from 12 countries in diagnosing breast disease and reporting prognostic features of carcinomas. Virchows Arch 434:3-10
17. Wagnon MC, Back C, Shannoun F, Scharpantgen A, Lux C (2000) Luxembourg: expérience d'un programme national de dépistage du cancer du sein dans des structures médicales existantes. La Lettre du Sénologue 7:14-18
18. Weyler J, Schrijver J, Vandermeeren I, Vuysteke de Laps L (eds) (1998) Multicenterstudie borstkankerscreening Vlaanderen. Ministerie van de Vlaamse Gemeenschap, Brussel
19. Winchester D, Cox J (1998) Standards for diagnosis and management of invasive breast carcinoma. CA Cancer J Clin 48: 83–107
20. Zafrani B, Contesso G, Eusebi V, Holland R, Millis RR, Peterse JL (1995) Guidelines for the pathological management of mammographically detected breast lesions. The Breast 4: 52–56