



BREAST UNITS AND NIPPLE-SPARING MASTECTOMY: A NATIONAL PORTRAIT COMPARED TO INTERNATIONAL CONSENSUS (PART 1)

UNIDADES DE MAMA E MASTECTOMIA COM PRESERVAÇÃO DO COMPLEXO AREOLO-MAMILAR: UM RETRATO NACIONAL COMPARADO COM O CONSENSO INTERNACIONAL (PARTE 1)

 Fernando OSÓRIO¹, Elza ALMEIDA², Rosa FÉLIX³,  Pedro GOUVEIA⁴, Manuel Lima TERROSOS⁵, Catarina RODRIGUES SANTOS⁶

¹ ULS S. João, Faculdade de Medicina da Universidade do Porto

² ULS Algarve

³ ULS Alentejo Central

⁴ Fundação Champalimaud, Faculdade de Medicina da Universidade de Lisboa

⁵ ULS Alto Ave

⁶ H. CUF Descobertas, Faculdade de Medicina da Universidade de Lisboa

Co-authors by survey completion (in alphabetical order): Abreu Sousa J, IPO-Porto, Porto; Alves N, H. St. Maria / CHU Lisboa Norte, Lisboa; Branco L, H. S. Bernardo, Setúbal; Camara S, H. Nélio Mendonça, Funchal; Caramelo O, CHU Coimbra, Coimbra; Carvalhal S, Joaquim Chaves Saúde – Clínica de Carcavelos, Cascais; Carvalho J, H. Senhora da Oliveira, Guimarães; Cortez Vaz F, CH. S. Teotónio, Viseu; Fernandes F, CH VNGaia e Espinho, VN Gaia; Ferrão I, IPO-Coimbra, Coimbra; Ferreira S, H. St. Luzia, Viana do Castelo; Fidalgo P, H. S. Francisco Xavier / CH Lisboa Ocidental, Lisboa; Fougo JL, CHU S. João, Porto; Gouveia P, Fundação Champalimaud, Lisboa; Gonzales Cruz A, H. Luz, Setúbal; Leite B, H. Pedro Hispano / ULS Matosinhos, Matosinhos; Lopes P, H. Luz, Lisboa; Martins F, CH Póvoa de Varzim-Vila do Conde, Póvoa de Varzim; Mestre L, H. Luz Tejo, Lisboa; Negreiros I, H. CUF Descobertas, Lisboa; Nogueira M, H. Santarém, Santarém; Pereira C, H. Garcia de Orta, Almada; Polónia J, CHU St. António, Porto; Ramalho L, H. Nossa Senhora do Rosário, Barreiro; Ribeiro S, H. Espírito Santo de Évora, Évora; Rocha MJ, H. Braga, Braga; Rodrigues C, H. CUF Santarém, Santarém; Rosado D, H. Portalegre, Portalegre; Santos C, IPO-Lisboa, Lisboa; Santos T, H. S. Sebastião, Feira; Vargas Moniz J, H. Lusíadas, Lisboa.

Correspondence: Fernando Osório (fernando.osorio@ulssjoao.min-saude.pt)

Received: 30/03/2024

Accepted: 12/05/2024

Published online: 27/07/2024

ABSTRACT

Introdução: The Chapter of Breast Surgery of the Portuguese Society of Surgery aimed to find out how hospitals treating breast cancer (BC) in Portugal are organized into breast units and how nipple-sparing mastectomy (NSM) with immediate breast reconstruction (IBR) is performed in clinical practice. **Methods:** Forty-five hospitals were invited to participate in an anonymous online survey in March 2023, just before the XLIII National Congress of Surgery. A qualitative and quantitative description of the responses was made. A complementary comparison was made with two international consensus, one from the European Society of Breast Cancer Specialists (EUSOMA) and the other from the Oncoplastic Breast Consortium (OPBC). **Results:** We received 31 responses (68.9%). Almost all hospitals



<https://doi.org/10.34635/rpc.1034>



ISSN: 1646-6918

© Authors

Revista Portuguesa de Cirurgia 2024 (57): 1034

eISSN: 2183-1165

(96.8%) had an organized breast unit. The national units meet the main EUSOMA requirements: multidisciplinary organization (100%), inclusion of at least two fully dedicated breast surgeons (100%), and a minimum volume of 150 newly diagnosed BC per year (77.4%). The OPBC expert consensus that NSM should only be performed by high-volume surgeons can be inferred in our national units based on 3 criteria: the annual volume of newly diagnosed BC, the number of dedicated surgeons, and the volume of NSM performed per year. All national units routinely perform NSM, but only 10% reported a high volume of more than 50 NSM per year. In cautious agreement with the OPBC statement on the oncological safety of NSM, half of the 30 breast units questioned it given the lack of long-term outcomes. Inflammatory carcinoma and direct nipple involvement were considered the only absolute contraindications to NSM. Other possible NSM contraindications were considered relative or questionable. **Conclusion:** This national portrait has demonstrated that well-organized, efficient breast units with an adequate volume of care are already in place in most hospitals treating BC. Similarly, the technical (and temporal) differentiation of breast surgeons has been demonstrated by the successful completion of a differentiated surgical procedure such as NSM plus IBR in daily practice.

Keywords: breast cancer units, organization, nipple-sparing mastectomy, immediate breast reconstruction.

RESUMO

Introdução: O Capítulo de Cirurgia da Mama da Sociedade Portuguesa de Cirurgia procurou avaliar como os hospitais portugueses que tratam cancro da mama estão organizados em unidades de mama e como é realizada, na prática clínica, a mastectomia poupadora de pele e do complexo areolo-mamilar (NSM). **Métodos:** Quarenta e cinco hospitais foram convidados a participar num inquérito a nível nacional em março de 2023. Foi feita uma descrição qualitativa e quantitativa. Adicionalmente realizou-se uma comparação com dois consensos internacionais, um da European Society of Breast Cancer Specialists (EUSOMA) e o outro do Oncoplastic Breast Consortium (OPBC). **Resultados:** Tivemos 31 (68,9%) respostas. Quase todos os hospitais (96,8%) tem uma unidade de mama organizada. As unidades nacionais cumprem os principais requisitos da EUSOMA: organização multidisciplinar (100%), inclusão de pelo menos dois cirurgiões dedicados à cirurgia mamária (100%) e um volume mínimo de 150 novos casos de cancro da mama por ano (77,4%). O consenso de peritos do OPBC defende que a NSM deve apenas ser realizada por cirurgiões com um elevado volume cirúrgico pode ser inferido nas unidades nacionais, com base em três critérios: o volume anual de novos diagnósticos de cancro, o número de cirurgiões dedicados e o volume de NSM realizado por ano. Todas as unidades nacionais realizam a NSM na sua rotina, mas apenas 10% reportam um volume elevado com mais de 50 NSM por ano. Numa concordância cautelosa com a OPBC sobre a segurança oncológica da NSM, metade das 30 unidades nacionais questionaram os seus resultados a longo prazo. As únicas contraindicações absolutas à NSM foram o carcinoma inflamatório e o envolvimento direto do complexo areolo-mamilar. Todas as outras possíveis contraindicações foram consideradas relativas ou questionáveis. **Conclusão:** Este retrato nacional mostrou que as unidades de mama estão bem organizadas, são eficientes e têm um volume assistencial adequado na maioria dos hospitais que tratam cancro da mama. Da mesma forma, a diferenciação técnica (e temporal) dos cirurgiões de mama ficou demonstrada pela realização bem sucedida na rotina diária de um procedimento cirúrgico diferenciado, como a NSM com reconstrução imediata.

Palavras chave: unidades de cancro da mama, organização, mastectomias com conservação do mamilo, reconstrução imediata da mama.

INTRODUCTION

The Chapter of Breast Surgery of the Portuguese Society of Surgery (SPCIR) has invited hospitals treating breast cancer (BC) to participate in a nationwide survey on their organization in breast

units and on some technical aspects of nipple-sparing mastectomy (NSM) with immediate breast reconstruction (IBR).

The aim was a national portrait to find out current institutional clinical practice in different regions of the country and in different Portuguese



public and private hospitals. It wasn't an audit of best clinical practice, but rather an assessment of logistical organization and technical-surgical skills. The ethical and educational imperative to know and compare the organizational structure and scientific trends, namely surgical training, in the different hospital services that treat BC in Portugal at SPCIR also needed to be put in perspective with international standards. The results of this survey were publicly presented at the XLIII National Congress of Surgery in March 2023 and are now being compared with two international consensus: that of the European Society of Breast Cancer Specialists (EUSOMA), which formalizes organizational criteria for breast units¹, and that of the Oncoplastic Breast Consortium (OPBC), which is committed to the mission of promoting standard clinical for safe and effective oncoplastic surgery².

The fundamental principles of modern BC surgery are to achieve both optimal oncologic and cosmetic outcomes. In the last 30 years, there have been remarkable technical developments in BC surgical treatment, motivated mainly by aesthetic concerns and a philosophical evolution from "maximum tolerable" to "minimum effective"³. From the beginnings of breast conservative surgery (BCS) to the successful implementation of sentinel node biopsy, we are now in the appealing era of oncoplastic breast surgery, where we have a variety of technical options – volume mobilization, volume replacement, perforator flaps, or fat grafting. Among these, one of the most technically challenging surgical procedures – NSM – deserves attention due to its high technical demands and professional responsibility. NSM was a validated option in highly selected women and proper technical execution [2]. By preserving the skin envelope and the nipple-areolar complex (NAC), it allows for a better cosmetic outcome of IBR^{4,5}.

Robotic NSM, a game-changer by miniaturizing access and magnifying vision through a small axillary incision to perform both ablative and reconstructive procedures, provides crucial aesthetic value by

avoiding visible surgical scars on the front of the female torso⁶⁻⁸. This minimally invasive NSM is still considered experimental and limited to specialized robotic centers, albeit with acceptable short-term cosmetic and oncologic outcomes (and ongoing clinical trials to assess cost-effectiveness and long-term oncologic data)⁹⁻¹². However, it represents an emerging and promising paradigm shift in how NSM plus IBR will be performed, as discussed at the XLIII National Congress of Surgery.

MATERIAL AND METHODS

The Chapter of Breast Surgery of the SPCIR invited 45 hospitals treating BC in Portugal to participate in a nationwide survey on the organization of breast units and technical aspects of NSM plus IBR in their clinical practice.

The "Google Forms" methodology was used to complete the online survey, quickly and anonymously during March 2023, just before the XLIII National Congress of Surgery.

In a national geographical distribution, in alphabetical order and using their names at the time, 31 hospitals responded, 9 from the North of Portugal (CHU S. João, Porto; CHU St. António, Porto; CH VNGaia e Espinho; H. Braga; CH Póvoa de Varzim-Vila do Conde; H. Senhora da Oliveira, Guimarães; H. St. Luzia, Viana do Castelo; IPO-Porto; ULS Pedro Hispano, Matosinhos), 4 from the Center (CHU Coimbra; H. S. Sebastião, Feira; H. S. Teotónio, Viseu; IPO-Coimbra) and 17 from the South, of which 9 were public (H. Espírito Santo de Évora; H. Garcia de Orta, Almada; H. Portalegre; H. St. Maria / Lisboa Norte; H. Santarém; H. S. Bernardo, Setúbal; H. S. Francisco Xavier, Lisboa Ocidental; H. Nossa Senhora Rosário, Barreiro; IPO-Lisboa) and 8 private (Fundação Champalimaud, Lisboa; H. CUF Descobertas, Lisboa; H. CUF Santarém; H. Lusíadas, Lisboa; H. Luz, Lisboa; H. Luz Tejo, Lisboa; H. Luz, Setúbal; Joaquim Chaves Saúde – Clínica de Carcavelos). From Madeira,



H. Nélio Mendonça, Funchal, responded. All data queried reports on the volume of care they provide through 2022.

An anonymized qualitative and quantitative description of the answers was made. Descriptive statistics were not performed. Ethics committee approval was not sought as no individual patient data were involved.

A complementary comparison was made with two recently published international consensus, one from the European Society of Breast Cancer Specialists (EUSOMA)¹ and the other from the Oncoplastic Breast Consortium (OPBC)².

RESULTS

Of the 45 hospitals that were invited, 31 (68.9%) agreed to take part in the survey. In a general organizational characterization, the question “Do you have a formally and functionally organized breast unit?” was answered affirmatively by 30 (96.8%) of these 31 departments. Table 1 describes the characterization of national breast units. In their multidisciplinary organization, and the multidisciplinary therapeutic decision-making meeting (MDM), these 30 units include the core specialties of Medical Oncology (100%), Pathology (96.7%), Radiology (96.7%), Radiation Oncology (93.3%), General Surgery (90%), Plastic and Reconstructive Surgery (83.3%), Gynecology (60%), and Genetics (53.3%). Three units (10%) are led by gynecologists with no general surgeons in the multidisciplinary team. Twenty-two units (73.3%) have a dedicated nursing team. Only two (6.7%) units reported integrated social support and one had a data manager. Thirteen (43.3%) reported having their physical facilities. Nineteen units have three to five surgeons fully dedicated to breast surgery, while six have only two dedicated surgeons and five have more than five dedicated surgeons.

Most of the 31 departments treated more than 150 new cases of breast cancer in 2022: 35.5%

treated between 150-200 new cases, 32.3% treated 200-500 new cases, 6.5% treated between 500-1000 new cases and 3.2% treated more than 1,000 new cases. No quantification (or estimated oncoplastic differentiation) of the annual surgical volume per surgeon was asked. When asked about the surgical treatment of BC regarding the proportion of mastectomy versus BCS, only 27 services responded, citing a lack of current data for 2022. Thirteen reported a mastectomy rate of less than or equal to 25%, with three reporting a rate of less than 15%. Ten reported a rate between 26-40%, three between 40-50%, and one service reported having 55% of mastectomies.

The therapeutic proposal for NSM plus IBR was always decided in the MDM. In four units, this decision was immediately discussed with the Plastic Surgery team in the presence of the patient. However, in most breast units, 27 (87.1%), this decision is made with the patient not present, who is then referred to a specific in-person appointment with Plastic Surgery. Twenty-eight (90.3%) units offer either immediate or delayed breast reconstruction. One unit offers immediate reconstruction only. The percentage of IBR was highly variable, ranging from less than 5% to more than 95%. Six units did so in less than 15% of mastectomies, ten between 20-40%, seven between 40-70%, and four in more than 90% of mastectomies. Table 2 describes the characterization of NSM plus IBR. Attempting to quantify the volume and surgical experience of each unit in 2022, only 10% of breast units reported performing more than 50 NSM plus IBR. At the other extreme, 40% performed less than 10, 30% performed between 11-20, and 20% performed between 21-50 NSM per year. The most predictable answer to the question “Who performs the breast reconstruction?” – a plastic surgeon – occurred in only one-third of units, surpassed by a combined surgical team sharing technical experience in 50%, and in five units the IBR was performed by the same breast surgeon who performed the mastectomy.



TABLE 1 – Characterization of national breast units.

		(n)	(%)	EUSOMA requirement
Breast unit (n=31)	Yes	30	96.8%	compliance
	No	1	3.2%	noncompliance
MDM members (n=30)	Medical Oncology	30	100%	compliance
	Pathology	29	96.7%	compliance
	Radiology	29	96.7%	compliance
	Radiation Oncology	28	93.3%	compliance
	General Surgery	27	90%	compliance
	Plastic Surgery	25	83.3%	compliance
	Nuclear Medicine	23	76.7%	compliance
	Rehabilitation Medicine	20	66.7%	compliance
	Gynaecology	18	60%	compliance
	Genetics	16	53.3%	compliance
	Psychology/Psychiatry	4	13.3%	noncompliance
	Palliative Care	1	3.3%	noncompliance
	OncoGeriatrics	1	3.3%	noncompliance
	Breast care nurse	22	73.3%	compliance
	Social support	2	6.7%	noncompliance
Data manager	1	3.3%	noncompliance	
No. breast surgeon (n=30)	2 fully dedicated surgeon	6	20%	compliance
	2-5 fully dedicated surgeon	19	63.3%	compliance
	>5 fully dedicated surgeon	5	16.7%	compliance
BC caseload per year (n=31)	<150 new cases	7	22.6%	noncompliance
	150-200 new cases	11	35.5%	compliance
	201-500 new cases	10	32.3%	compliance
	501-1000 new cases	2	6.5%	compliance
	<1000 new cases	1	3.2%	compliance
% Mastectomy vs BCS (n=27)	<15%	3	11.1%	not discussed
	16-25%	10	37%	not discussed
	26-40%	10	37%	not discussed
	41-50%	3	11.1%	not discussed
	>51%	1	3.7%	not discussed
% IBR (n=27)	<15%	6	22.2%	noncompliance
	20-40%	10	37%	noncompliance
	41-70%	7	25.9%	compliance
	>90%	4	14.8%	compliance
NSM plus IBR decision-making (n=31)	always in MDM	31	100%	compliance



TABLE 2 – Characterization of NSM plus IBR.

		(n)	(%)	OPBC recommendation
NSM caseload per year (n=30)	<10	12	40.0%	noncompliance
	11-20	9	30.0%	noncompliance
	21-50	6	20.0%	compliance
	>50	3	10.0%	compliance
Who performs IBR (n=30)	plastic surgeon	10	33.3%	compliance
	combined surgical team	15	50.0%	compliance
	breast oncologic surgeon	5	16.7%	compliance
NSM contraindications (n=30)	cT4d/inflammatory BC	18	60.0%	compliance
	indication for adjuvant RT	15	50.0%	not discussed
	cT3/cN+ tumors	15	50.0%	compliance
	unproven oncological safety	15	50.0%	noncompliance
	tumor close/adherent to skin	15	50.0%	compliance
	central/retroareolar tumor	13	43.3%	compliance
	smoking	11	36.7%	not discussed
	bulky/ptotic breast	10	33.3%	compliance
	overweight	5	16.7%	not discussed
	nipple bleeding discharge	3	10.0%	compliance
	patient refusal of reoperation	1	3.3%	not discussed
	MRI or pathologic NAC invasion	1	3.3%	compliance
	Intraop. NAC pathology (n=30)	routinely performed	15	50.0%
in selected cases		11	36.7%	not discussed
never done		4	13.3%	not discussed
NSM preferred skin incision (n=30)	inframammary fold	20	66.7%	compliance
	Wise reduction pattern	12	40.0%	compliance
	periareolar with radial extension	6	20.0%	compliance
	or with lower vertical extension	3	10.0%	compliance
	lateral mammary fold	3	10.0%	compliance
	roundblock	1	3.3%	not discussed
NAC viability strategy (n=30)	skin incision placement	25	83.3%	compliance
	respect dissection plane	23	76.7%	compliance
	respect superficial fascia	23	76.7%	compliance
	respect subdermal irrigation	23	76.7%	compliance
	partial scissors dissection	16	53.3%	not discussed
	preserve branches of axillar art.	11	36.7%	compliance
	preserve internal mammary art.	11	36.7%	compliance
	avoidance of electric scalpel	8	26.7%	compliance
	partial scalpel blade dissection	8	26.7%	not discussed
	free NAC graft	7	23.3%	compliance
	flap angiography (ICG)	5	16.7%	compliance
flap transillumination	3	10.0%	not discussed	



		(n)	(%)	OPBC recommendation
	pre-defined flap thickness	2	6.7%	noncompliance
	high-freq. ultrasound dissection	1	3.3%	not discussed
IBR surgical options (n=30)	pre-pectoral implant	18	60.0%	compliance
	direct implant plus dermal matrix	17	56.7%	compliance
	two-stage expander/implant	15	50.0%	compliance
	sub-pectoral implant	12	40.0%	compliance
	direct implant non-covered	9	30.0%	compliance
	latissimus dorsi flap + implant	6	20.0%	compliance
	TRAM myocutaneous flap	2	6.7%	compliance
	DIEP free flap	1	3.3%	compliance
Operative time duration (n=30)	<2.5 hours	15	50.0%	not discussed
	2.5-4 hours	15	50.0%	not discussed
Hospitalization regime (n=30)	inpatient procedure	28	93.3%	not discussed
	outpatient with overnight stay	2	6.7%	not discussed
Discharge / drains removal (n=30)	day 2 with drains	17	56.7%	not discussed
	day 5 without drains	7	23.3%	not discussed
	day 1 with drains	3	16.7%	not discussed
	day 3 with drains	1	3.3%	not discussed
	day 7 without drains	1	3.3%	not discussed
	day 10 without drains	1	3.3%	not discussed
Surgical morbidity (n=30)	NAC ischemia/necrosis	17	56.7%	compliance
	hemorrhage/hematoma	12	40.0%	compliance
	partial skin flap ischemia/necrosis	10	33.3%	compliance
	infection	4	13.3%	compliance
	implant exposure	4	13.3%	not discussed
Re-interventions (n=30)	<2%	14	46.7%	not discussed
	5-10%	14	46.7%	not discussed
	10-25%	1	3.3%	not discussed
	>25%	1	3.3%	not discussed
Outcome prospective registry (n=30)	Yes	9	30.0%	compliance
	No	21	70.0%	noncompliance
Aesthetic evaluation (n=28)	subjective surgeon's opinion	12	42.9%	noncompliance
	subjective patient's opinion	7	25.0%	noncompliance
	evaluation of PROs	6	21.4%	compliance
	validated computerized tool	2	7.1%	compliance
	multidimensional not specified	1	3.6%	noncompliance
Participation in RCTs (n=30)	Yes	4	13.3%	compliance
	No	26	86.7%	noncompliance



Indications for NSM were not queried as we preferred to know their potential contraindications the majority reported the predictable indication for adjuvant radiotherapy, namely inflammatory BC (60%) or cT3/N+ tumors (50%). Similarly, half of the units reported unproven oncological safety or in the presence of a tumor close to or adherent to the skin, especially in a central/retroareolar localization. One-third didn't consider it in a bulky and ptotic breast. One unit contraindicated NSM when the patient refused to accept the foreseeable risk of surgical reintervention due to flap necrosis, and another when confronted with a proven invasion of the NAC, either by MRI or by extemporaneous examination of the retroareolar tissue. However, this pathological procedure is routinely performed in half of breast units, but only in selected cases in 36.7% and never in 13.3%.

Concerning the details of the NSM surgical technique, the most preferred skin incision, among many options, was the inframammary fold incision in 66.7%, followed by the Wise reduction pattern in 40%, and the periareolar incision with radial extension (at the transition of the outer quadrants) in 20% or lower vertical extension (at the transition of the lower quadrants) in 10%. Beyond the skin incision placement, there were several operative tactics and techniques to preserve the NAC viability, some of which were interlinked. Respect for the anatomical plane of dissection, including subdermal irrigation of the skin flaps, was consensual for twenty-three (76.7%) units. Only two (6.7%) advocated a pre-defined flap thickness of 1 cm. Five (16.7%) used intraoperative skin flap angiography with indocyanine green, and three (10%) prefer to use transillumination to assess flap vascularization. Another anatomical landmark, the preservation of the branches of the thoracoacromial, lateral thoracic and especially the internal mammary arteries, was emphasized by eleven (36.7%). Seven (23.3%) units routinely use a free NAC graft, particularly in a Wise reduction pattern. Despite these technical precautions, most units, twenty-three (76.7%),

used the electric scalpel alone or in combination to perform NSM. Although eight (26.7%) advocated avoiding the use of electric energy, only four (13.3%) reported using scissors exclusively and two (6.7%) used the (cold) scalpel blade for tissue dissection. Only one unit reported the use of high-frequency ultrasound energy.

IBR was performed with different technical options, depending on the choices and preferences of each surgical team. The most common technique was the placement of a silicone implant, preferably in the pre-pectoral plane in eighteen (60%) units. The most popular reconstruction was one-stage direct implant placement, covered with an acellular dermal matrix (or synthetic mesh) in seventeen (56.7%) units. Two-stage solutions (expander/implant) were used in half of the units. Autologous reconstructive solutions were less commonly preferred for IBR.

Twenty-eight (93.3%) units perform NSM as an inpatient procedure, the majority (56.7%) with an estimated duration of 2 days. Conversely, two (6.7%) units promote an outpatient regime with an overnight stay of 23 hours in selected cases. All units routinely use aspiration drains. The timing of their removal was difficult to standardize and varied from 2-10 days post-operatively. Regarding the predictability of the duration of the operative time of NSM with IBR, exactly half of the units said it would take less than 2.5 hours and the other half between 2.5-4 hours.

Twenty-one (70%) units do not have a prospective NSM outcomes registry. This may limit conclusions about their real morbidity. The most frequently reported operative complications were NAC ischemia/necrosis (56.7%), haemorrhage/hematoma (40%), partial skin flap ischemia/necrosis (33.3%), infection (13.3%), and implant exposure (13.3%). Most centres reported a low prevalence of surgical reinterventions due to complications (46.7% in less than 2%, the same proportion in 5-10%). The scarcity of prospective records, coupled with the variability of answers, also limits the assessment of



the aesthetic outcomes. There were only 28 responses to this endpoint: twelve preferred the surgeon's opinion, which was subjective, while thirteen preferred the patient's opinion, either through their subjective assessment (25%) or by completing patient-reported outcomes (PROs) questionnaires (21.4%). Standardized aesthetic assessment using a validated computerized tool is available in only two units. Participation in a prospective, multicenter, international study of NSM was reported by four units (13.3%). As this was outside the scope of our survey, we did not ask about oncological outcomes, particularly local recurrence.

DISCUSSION

For more than twenty years, EUSOMA has advocated the organization of BC diagnosis and treatment in specialized breast units based on compliance with well-defined, measurable, and auditable quality indicators. The main requirements are scientific excellence, time commitment and multidisciplinary, which are well established in successive clinical recommendations that are regularly updated¹.

The survey we carried out to better understand the national context revealed that almost all (96.8%) of the 31 hospital departments that agreed to collaborate declared that they had a formally organized breast unit. The indispensable critical mass and multidisciplinary organization, especially of the MDM, were not only well-defined in our survey, but also meet the formal requirements of EUSOMA¹. It should be noted that EUSOMA already has 3 certified units in Portugal. Core medical specialities essential to the diagnosis and treatment of BC are well represented: Medical Oncology (100%), Pathology (96.7%), Radiology (96.7%), Radiation Oncology (93.3%), General Surgery (90%), Plastic and Reconstructive Surgery (83.3%), Nuclear Medicine (76.7%), Gynecology (60%), and Genetics (53.3%), as well as a dedicated nursing team (73.3%).

On the contrary, major non-compliance with the latest EUSOMA clinical recommendations can be seen in the lack of attention paid to psychological support (13.3%), and even more clearly in the fact that only one unit has a dedicated oncogeriatric team. However, it is not appropriate to make an inference about the quality of care, as this would require an audit that can only be carried out by EUSOMA.

EUSOMA also proposes quantitative recommendations. It states that a breast unit should treat at least 150 new cases of BC per year¹. In our survey, the vast majority (77.4%) met this requirement when asked about the volume of care in 2022. Only 22.6% had fewer than 150 new cases per year. All participating national units met the EUSOMA technical requirement of having at least two fully dedicated breast surgeons with appropriate training in oncoplastic surgery, but the requirement for each breast surgeon to operate on at least 50 new cancer cases per year was neither questioned nor evaluated.

The 2018 consensus of the OPBC, which involved 44 breast surgeons of recognized experience and merit from 14 countries, noted considerable heterogeneity in clinical practice and hence substantial disagreement in the expert panel on numerous technical aspects of NSM plus IBR². Without a consensus, but with a clear majority, the OPBC expert panel stated the oncological safety of NSM, but not without some concerns about the completeness of the breast gland removal by the possibility of residual breast tissue remaining in the skin envelope, especially behind the NAC. In our nationwide survey, there was cautious agreement with this statement, as although all 30 breast units routinely performed NSM, half questioned the oncological safety, which was not fully established in the literature.

The OPBC expert panel reached a consensus on the need to standardize indications, contraindications, technical aspects, and outcomes assessment in NSM plus IBR. It was validated as a safe option



with careful patient selection and proper technical execution. More interesting than the discussion of surgical indications, as it was agreed that it could always be considered if there was no direct skin or NAC involvement, regardless of axillary staging, was the debate on contraindications. The panel reached a consensus that inflammatory carcinoma (cT4d) is an absolute contraindication to NSM, even after complete remission following neoadjuvant chemotherapy. There was also a strong consensus that clinical, imaging, or histologic involvement (R1 resection on extemporaneous pathology) of the NAC is an absolute contraindication to nipple preservation. No other consensus was reached by the OPBC expert panel. Several relative contraindications were considered questionable (T3-T4b tumors, N+ tumors, adjuvant radiotherapy, bulky (\geq C cup) and ptotic (\geq grade 2) breast, nipple bleeding discharge), all of which were also addressed by our national units.

In this international consortium, there was a strong consensus recommending that NSM should only be performed by high-volume surgeons with proven surgical experience, as they themselves are predictors of lower morbidity and, above all, local recurrence. Without carrying out this qualitative assessment, we can infer, at a national level, adequate technical experience supported by 3 criteria: 1) the number of dedicated surgeons, since most breast units have three to five (63.3%) or more than five (16.7%) full-time breast surgeons, exceeding the EUSOMA minimum requirement; 2) the annual volume of care, since 77.4% of the 31 departments surveyed treated more than 150 new cases of breast cancer per year, following the EUSOMA recommendation; and 3) the annual surgical volume, as although only 10% reported a high volume with more than 50 NSM per year, half of the breast units performed between 11-50 NSM in 2022.

In surgical technique, there was a strong consensus among the OPBC panel that the anatomical limits of the mammary gland should be respected,

particularly in defining the thickness of the skin flaps in NSM, which should be determined by the location and depth of the superficial fascia (and never by a predefined thickness). This technical detail, the respect to the anatomical plane of dissection, which includes subdermal irrigation, was mostly (76.7%) recommended at the national level. The surgical incision in the inframammary fold was the most common and popular approach among us, as in the OPBC panel, but this expert panel did not favour it, suggesting that this critical choice – incision placement – should depend on the size and shape of the breast and the surgeon's preferences. No consensus was achieved in the OPBC panel regarding the preferred method of IBR, and it was suggested that the diversity of options will require comparative clinical trials.

Regarding morbidity, the OPBC panel was very concerned about skin ischemia/necrosis. Due to insufficient and conflicting evidence in the literature, there was no consensus on the location of the surgical incision, the surgical technique for dissecting the skin flaps, their thickness, or the use of an electric scalpel. There was consensus only on the technical differentiation of the surgeon, as cited above, and on the minimization of excessive force and time in the intraoperative retraction of the flaps, curiously two aspects that no national unit mentioned as risk factors for skin flap necrosis. All other possible intraoperative tactics to preserve the viability of the NAC recommended by the OPBC expert panel were also followed at the national level. No consensus was reached in the OPBC on the potential benefit of intraoperative assessment of vascular viability of the NAC and skin flap, nor on the best technical option for doing so. Intravenous indocyanine green angiography is routinely used in only five national units.

As EUSOMA does more generically, the final recommendations of the OPBC consensus are to establish a prospective registry of patients undergoing NSM with evaluation of aesthetic (and oncologic) outcomes and completion of PROs measurements,



as well as participation in multicenter randomized clinical trials to assess the safety and efficacy of the different technical options¹³. In our survey, only nine (30.0%), six (21.4%), and four (13.3%) units complied with these recommendations, respectively.

CONCLUSION

With this brief and certainly imperfect national portrait, the Chapter of Breast Surgery of the SPCIR has been able to demonstrate that, following

the national and international recommendations advocated in recent decades, well-organized, efficient breast units with an adequate volume of care are already in place in the different public and private hospitals treating BC. Similarly, the technical (and temporal) differentiation of breast surgeons has been demonstrated by the successful completion of a differentiated surgical procedure such as NSM plus IBR in daily practice. Therefore, in Portugal, the move towards the formal implementation of a Competence in Breast Surgery by the Portuguese Medical Association is understandable and justified.

REFERENCES

1. Biganzoli L, Cardoso F, Beishon M, Cameron D, Cataliotti L, Coles CE, Delgado Bolton RC, Trill MD, Erdem S, Fjell M, Geiss R, Goossens M, Kuhl C, Marotti L, Naredi P, Oberst S, Palussière J, Ponti A, Rosselli Del Turco M, Rubio IT, Sapino A, Senkus-Konefka E, Skelin M, Sousa B, Saarto T, Costa A, Poortmans P. The requirements of a specialist breast centre. *Breast*. 2020 Jun;51:65-84. doi: 10.1016/j.breast.2020.02.003. Epub 2020 Feb 26. PMID: 32217457; PMCID: PMC7375681.
2. Weber WP, Haug M, Kurzeder C, Bjelic-Radisic V, Koller R, Reitsamer R, Fitzal F, Biazus J, Brenelli F, Urban C, Paulinelli RR, Blohmer JU, Heil J, Hoffmann J, Matrai Z, Catanuto G, Galimberti V, Gentilini O, Barry M, Hadar T, Allweis TM, Olsha O, Cardoso MJ, Gouveia PF, Rubio IT, de Boniface J, Svensjö T, Bucher S, Dubsy P, Farhadi J, Fehr MK, Fulco I, Ganz-Blättler U, Günthert A, Harder Y, Hauser N, Kappos EA, Knauer M, Landin J, Mechera R, Meani F, Montagna G, Ritter M, Saccolotto R, Schwab FD, Steffens D, Tausch C, Zeindler J, Soysal SD, Lohsiriwat V, Kovacs T, Tansley A, Wyld L, Romics L, El-Tamer M, Pusic AL, Sacchini V, Gnant M. Oncoplastic Breast Consortium consensus conference on nipple-sparing mastectomy. *Breast Cancer Res Treat*. 2018 Dec;172(3):523-537. doi: 10.1007/s10549-018-4937-1. Epub 2018 Sep 4. PMID: 30182349; PMCID: PMC6245050.
3. Veronesi U, Stafyla V, Luini A, Veronesi P. Breast cancer: from “maximum tolerable” to “minimum effective” treatment. *Front Oncol*. 2012 Oct 8;2:125. doi: 10.3389/fonc.2012.00125. PMID: 23061042; PMCID: PMC3465814.
4. Spear SL, Hannan CM, Willey SC, Cocilovo C. Nipple-sparing mastectomy. *Plast Reconstr Surg*. 2009 Jun;123(6):1665-1673. doi: 10.1097/PRS.0b013e3181a64d94. PMID: 19483564.
5. Galimberti V, Vicini E, Corso G, Morigi C, Fontana S, Sacchini V, Veronesi P. Nipple-sparing and skin-sparing mastectomy: Review of aims, oncological safety and contraindications. *Breast*. 2017 Aug;34 Suppl 1(Suppl 1):S82-S84. doi: 10.1016/j.breast.2017.06.034. Epub 2017 Jun 30. PMID: 28673535; PMCID: PMC5837802.
6. Toesca A, Peradze N, Manconi A, Galimberti V, Intra M, Colleoni M, Bonanni B, Curigliano G, Rietjens M, Viale G, Sacchini V, Veronesi P. Robotic nipple-sparing mastectomy for the treatment of breast cancer: Feasibility and safety study. *Breast*. 2017 Feb;31:51-56. doi: 10.1016/j.breast.2016.10.009. Epub 2016 Nov 2. PMID: 27810700; PMCID: PMC5278881.
7. Toesca A, Peradze N, Galimberti V, Manconi A, Intra M, Gentilini O, Sances D, Negri D, Veronesi G, Rietjens M, Zurrada S, Luini A, Veronesi U, Veronesi P. Robotic Nipple-sparing Mastectomy and Immediate Breast Reconstruction With Implant: First Report of Surgical Technique. *Ann Surg*. 2017 Aug;266(2):e28-e30. doi: 10.1097/SLA.0000000000001397. PMID: 28692558.
8. Sarfati B, Struk S, Leymarie N, Honart JF, Alkhashnam H, Tran de Fremicourt K, Conversano A, Rimareix F, Simon M, Michiels S, Kolb F. Robotic Prophylactic Nipple-Sparing Mastectomy with Immediate Prosthetic Breast Reconstruction: A Prospective Study. *Ann Surg Oncol*. 2018 Sep;25(9):2579-2586. doi: 10.1245/s10434-018-6555-x. Epub 2018 Jun 29. PMID: 29959612.
9. Angarita FA, Castelo M, Englesakis M, McCreedy DR, Cil TD. Robot-assisted nipple-sparing mastectomy: systematic review. *Br J Surg*. 2020 Nov;107(12):1580-1594. doi: 10.1002/bjs.11837. Epub 2020 Aug 26. PMID: 32846014.
10. Morrow M. Robotic mastectomy: the next major advance in breast cancer surgery? *Br J Surg*. 2021 Apr 5;108(3):233-234. doi: 10.1093/bjs/znab010. PMID: 33723570; PMCID: PMC10576415.
11. Park HS, Lee J, Lai HW, Park JM, Ryu JM, Lee JE, Kim JY, Marrazzo E, De Scalzi AM, Corso G, Montemurro F, Gazzetta G, Pozzi G, Toesca A. Surgical and Oncologic Outcomes of Robotic and Conventional Nipple-Sparing Mastectomy with Immediate



- Reconstruction: International Multicenter Pooled Data Analysis. *Ann Surg Oncol.* 2022 Oct;29(11):6646-6657. doi: 10.1245/s10434-022-11865-x. Epub 2022 May 18. PMID: 35583693.
12. Morrow M. Robotic Nipple-Sparing Mastectomy-Ready for Prime Time? *JAMA Surg.* 2024 Mar 1;159(3):276. doi: 10.1001/jamasurg.2023.7007. PMID: 38231509.
 13. Esgueva AJ, Noordhoek I, Kranenbarg EM, Espinosa-Bravo M, Mátrai Z, Zhygulin A, Irmejs A, Mavioso C, Meani F, González E, Özdemir M, Allweis T, Rogowski K, Dos Santos CR, Mora H, Ponzzone R, Samorani D, van de Velde C, Audisio RA, Rubio IT; INSPIRE collaborators group. Health-Related Quality of Life After Nipple-Sparing Mastectomy: Results From the INSPIRE Registry. *Ann Surg Oncol.* 2022 Mar;29(3):1722-1734. doi: 10.1245/s10434-021-10930-1. Epub 2021 Nov 8. Erratum in: *Ann Surg Oncol.* 2022 Sep;29(9):5828. PMID: 34748122.

