

# Patterns of care in surgical management

## Key observations

- Surgery was used to treat 69.9% of the patients with breast cancer registered at CM-VI and 86.1% of those registered at INO.
- Half of the surgeries used to treat the patients registered at CM-VI with stages I, II, and III breast cancer were BCS. Only 26.3% were BCS at INO. These proportions are much lower than the international benchmarks.
- Nearly 90% of the patients registered at CM-VI and 40% of the patients registered at INO underwent primary surgery at hospitals other than the oncology centres. Although the proportion decreased at INO with time, there was almost no change at CM-VI.
- More than 95% of the women had ALND. SLN biopsy facilities were not available.
- The proportion of women receiving postoperative radiotherapy after BCS was 38.3% at CM-VI and more than 75% at INO. Overall, 75.3% of patients at CM-VI and 91.8% of patients at INO received radiotherapy and/or chemotherapy along with BCS.
- The proportion of women receiving chemotherapy and/or radiotherapy with mastectomy was 79% at CM-VI and 88.5% at INO.

### 7.1 Principles of surgical management of breast cancer

Surgery is the mainstay of management for breast cancer. BCS, either upfront or after neoadjuvant chemotherapy, is the treatment of choice in patients with stage I to stage III breast cancers but should not be used in settings where mammographic assessment and postoperative radiotherapy are unavailable.

In such situations, the preferred surgical option is modified radical mastectomy (MRM) (Anderson et al., 2006).

Overall, 70% of the 785 patients with breast cancer registered at CM-VI (for whom treatment information was available) underwent surgery, either at the oncology centre or elsewhere.

At INO, 86.1% of the 1157 patients registered (for whom treatment information was available) under-

went surgery, either at the oncology centre or elsewhere.

In the following sections we discuss the surgical management used to treat the patients in further detail.

### 7.2 Surgical management of the study patients

#### 7.2.1 Place of surgery

At CM-VI, most of the 549 patients (89.1%) who underwent surgery had

had the procedure at a hospital or clinic other than the oncology centre. The proportion of patients who underwent surgery elsewhere was higher in 2013–2017 (91.9%) than in 2008–2012 (84.9%).

At INO, most of the patients who underwent surgery had the procedure at the centre. A total of 997 patients with breast cancer registered at INO underwent surgery; of these, 403 (41.1%) underwent surgery at a hospital or clinic other than the institute.

The proportion of patients who underwent initial surgery elsewhere was lower in 2013–2017 (32.3%) than in 2008–2012 (52.3%).

### 7.2.2 Type of surgery

MRM was the most frequently performed surgery for the patients registered at CM-VI; 48.6% of all surgically treated patients underwent MRM. This was closely followed by lumpectomy (BCS) with ALND, which was used in 45.5% of all surgically treated patients.

The proportion of patients who underwent MRM at CM-VI decreased from 52.1% in 2008–2012 to 46.4% in 2013–2017, with a corresponding increase in the proportion of patients who underwent BCS.

The proportion of patients who underwent MRM was higher at INO than at CM-VI. Among patients who underwent surgery, 73.0% of patients were treated with MRM and 25.4% with lumpectomy and ALND.

The proportion of surgically treated patients with breast cancer who underwent MRM decreased from 75.0% in 2008–2012 to 71.5% in 2013–2017, with a corresponding increase in the proportion who underwent BCS.

Overall, 50.0% of patients with stage I, II, or III cancer underwent BCS at CM-VI. The proportion was less (26.3%) at INO.

### 7.2.3 Type of surgery by stage of cancer and molecular subtype

We analysed the treatment data according to stage and molecular subtype of the tumours separately for CM-VI and INO (Table 7.1).

At CM-VI, BCS was more frequently used than mastectomy to treat patients with luminal-like stage I and II cancer, HER2-positive stage II cancer, and triple-negative stage I cancer. For HER2-positive stage I cancer, the proportion of patients who underwent BCS was the same as the proportion who underwent mastectomy. For all other types and stages, mastectomy was more commonly performed.

At INO, BCS was more common or at least as common as mastectomy for patients with stage I (all molecular subtypes) or luminal-like stage II cancer. For other types and stages, mastectomy was more commonly performed.

### 7.2.4 Adjuvant or neoadjuvant therapy with surgery

In an ideal situation, most patients undergoing BCS should receive at least radiotherapy; the exceptions are T1N0 ER-positive cancers with complete excision, especially in elderly women. Adjuvant chemotherapy is indicated on the basis of the estimated risk of recurrence. Neoadjuvant chemotherapy is often administered before surgery, especially in HER2-positive and triple-negative breast cancers.

At CM-VI, 100 (38.3%) of the 261 patients who underwent BCS received adjuvant radiotherapy, and 37.0% received adjuvant or neoadjuvant chemotherapy. Nearly a quarter (24.9%) of the CM-VI patients who underwent BCS did not receive chemotherapy or radiotherapy. The most common adjuvant therapy at

CM-VI for patients who underwent MRM was chemotherapy alone (39.3%), followed by a combination of chemotherapy and radiotherapy (36.7%). More than one fifth of the patients who underwent MRM (20.7%) did not receive chemotherapy or radiotherapy.

At INO, more than three quarters of the 255 patients who underwent BCS received postoperative radiotherapy, either in combination with chemotherapy (66.7%) or alone (8.6%); 16.5% of the patients who underwent BCS received chemotherapy alone, and just 8.2% of the patients received neither chemotherapy nor radiotherapy. At INO, 67.4% of the patients who underwent MRM received both chemotherapy and radiotherapy and 21.1% received chemotherapy alone.

## 7.3 Surgical management of breast cancer in Morocco compared with other settings

The European Society of Breast Cancer Specialists (EUSOMA) working group defined a minimum standard for a set of quality indicators for breast cancer care (Biganzoli et al., 2017). With regard to surgery and locoregional treatment, the working group stipulated the minimum standards as: (i) at least 90% of patients should be discussed pre- and postoperatively at the tumour board; (ii) at least 80% of patients should undergo some form of surgery; and (iii) at least 90% of patients with invasive breast cancer without metastasis should receive postoperative radiotherapy after BCS.

All breast cancer cases are routinely discussed in the weekly tumour board meetings at INO; this is in compliance with the good practice recommendations. However, the practice is different at CM-VI, where only the cases selected by the oncologists are referred to the tumour

**Table 7.1.** Type of surgery received according to stage at diagnosis and molecular type for patients with breast cancer

Stage at diagnosis	ER, PR, and HER2 status	Patients with stage and ER, PR, and HER2 status information	Type of surgery			
			ALND alone <i>n</i> (%)	Unspecified breast surgery with ALND <i>n</i> (%)	Breast lumpectomy <i>n</i> (%)	Mastectomy <i>n</i> (%)
<b>CM-VI</b>						
I	ER+ and/or PR+ and HER2-	33	0 (0.0)	2 (6.1)	21 (63.6)	10 (30.3)
	ER+ and/or PR+ and HER2+	6	0 (0.0)	0 (0.0)	3 (50.0)	3 (50.0)
	ER- and PR- and HER2+	6	0 (0.0)	0 (0.0)	3 (50.0)	3 (50.0)
	Triple-negative	7	0 (0.0)	0 (0.0)	6 (85.7)	1 (14.3)
II	ER+ and/or PR+ and HER2-	7	0 (0.0)	0 (0.0)	6 (85.7)	1 (14.3)
	ER+ and/or PR+ and HER2+	104	0 (0.0)	1 (1.0)	63 (60.6)	40 (38.5)
	ER- and PR- and HER2+	40	0 (0.0)	1 (2.5)	27 (67.5)	12 (30.0)
	Triple-negative	13	0 (0.0)	0 (0.0)	6 (46.2)	7 (53.8)
III	ER+ and/or PR+ and HER2-	13	0 (0.0)	0 (0.0)	6 (46.2)	7 (53.8)
	ER+ and/or PR+ and HER2+	48	0 (0.0)	1 (2.1)	24 (50.0)	23 (47.9)
	ER- and PR- and HER2+	67	0 (0.0)	2 (3.0)	22 (32.8)	43 (64.2)
	Triple-negative	32	1 (3.1)	1 (3.1)	12 (37.5)	18 (56.3)
IV	ER+ and/or PR+ and HER2-	32	1 (3.1)	1 (3.1)	12 (37.5)	18 (56.3)
	ER+ and/or PR+ and HER2+	13	0 (0.0)	0 (0.0)	6 (46.2)	7 (53.8)
	ER- and PR- and HER2+	22	0 (0.0)	0 (0.0)	6 (27.3)	16 (72.7)
	Triple-negative	12	0 (0.0)	0 (0.0)	3 (25.0)	9 (75.0)
<b>INO</b>						
I	ER+ and/or PR+ and HER2-	54	1 (1.9)	0 (0.0)	27 (50.0)	26 (48.1)
	ER+ and/or PR+ and HER2+	13	0 (0.0)	0 (0.0)	6 (46.2)	7 (53.8)
	ER- and PR- and HER2+	7	0 (0.0)	0 (0.0)	5 (71.4)	2 (28.6)
	Triple-negative	12	0 (0.0)	0 (0.0)	6 (50.0)	6 (50.0)
II	ER+ and/or PR+ and HER2-	12	0 (0.0)	0 (0.0)	6 (50.0)	6 (50.0)
	ER+ and/or PR+ and HER2+	230	0 (0.0)	4 (1.7)	72 (31.3)	154 (67.0)
	ER- and PR- and HER2+	86	0 (0.0)	1 (1.2)	12 (14.0)	73 (84.9)
	Triple-negative	33	0 (0.0)	0 (0.0)	6 (18.2)	27 (81.8)
III	ER+ and/or PR+ and HER2-	33	0 (0.0)	0 (0.0)	6 (18.2)	27 (81.8)
	ER+ and/or PR+ and HER2+	62	0 (0.0)	0 (0.0)	20 (32.3)	42 (67.7)
	ER- and PR- and HER2+	187	1 (0.5)	4 (2.1)	35 (18.7)	147 (78.6)
	Triple-negative	64	1 (1.6)	0 (0.0)	9 (14.1)	54 (84.4)
IV	ER+ and/or PR+ and HER2-	64	1 (1.6)	0 (0.0)	9 (14.1)	54 (84.4)
	ER+ and/or PR+ and HER2+	27	0 (0.0)	0 (0.0)	4 (14.8)	23 (85.2)
	ER- and PR- and HER2+	33	0 (0.0)	0 (0.0)	12 (36.4)	21 (63.6)
	Triple-negative	26	0 (0.0)	0 (0.0)	7 (26.9)	19 (73.1)

ALND, axillary lymph node dissection; CM-VI, Centre Mohammed VI pour le traitement des cancers; ER, estrogen receptor; HER2, human epidermal growth factor receptor 2; INO, Institut National d'Oncologie Sidi Mohamed Ben Abdellah; PR, progesterone receptor.

board. The benchmark of treating at least 80% of the patients with surgery was achieved at INO but not at CM-VI. The proportion of patients receiving adjuvant radiotherapy after BCS was lower than the standard benchmark at both institutions, more so at CM-VI.

There may be several explanations for the oncology centres not being able to achieve the benchmarks. First, the stage distribution of cancer patients in Morocco is still very different from that observed in the European settings where these standards were set. Second, surgical practice outside the oncology centres, especially in the private sector, may not be well regulated and the surgeons may not be following the appropriate guidelines. Third, many of the patients may not be compliant with the advice and may be reluctant to undergo radiotherapy and/or chemotherapy. Lastly, there is a possibility

that our investigators could not get access to complete data. This is particularly relevant at CM-VI, where the radiotherapy-related information is maintained entirely through an online system.

The low frequency of BCS in patients with breast cancer seen in Morocco is in line with that seen throughout the Eastern Mediterranean Region. The frequency of BCS in Arab countries reported by a study in 2007 ranged from 12% in the Syrian Arab Republic to 35% in Oman (El Saghir et al., 2007). A recent study in Iraq reported that 96% of the patients with breast cancer underwent surgery but only 3.6% underwent BCS (Alwan and Shawkat, 2020). The large number of patients with breast cancer undergoing surgery performed primarily by surgeons who are not oncosurgeons is also not unique to Morocco. In the absence of structured training facilities

in surgical oncology, breast cancer surgeries are frequently performed by general surgeons or gynaecologists in LMICs, and the quality of surgery is often suboptimal (Sullivan et al., 2015). A study in Malawi reported that breast cancers were even resected by non-physicians (Dare et al., 2015). The large number of patients with breast cancer undergoing surgery outside of oncology centres in Morocco may reflect the capacity of the non-oncology tertiary care centres to handle oncosurgery, which is desirable and may reduce the load on the publicly funded oncology centres. However, it is important to ensure that the surgeons performing procedures outside oncology centres are appropriately trained and follow evidence-based practices. A national protocol for managing breast cancers will be very useful to harmonize such practices.

## References

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