Incidence of second primary tumors and second primary breast cancers events in patients with metastatic breast cancer: results from the Austrian AGMT_MBC-Registry

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Background

Second primary tumors (SPTs) occur in approximately 10% of patients following an initial cancer diagnosis and are associated with increased cancer-related mortality. Ongoing advancements in systemic therapies have led to a growing population of both breast cancer (BC) survivors and patients living with metastatic disease. Consequently, individuals with BC face a heightened risk of developing SPTs and second primary breast cancers (SPBC), with a reported 25-year cumulative incidence of contralateral BC of about 10%. Here we present real-world data on SPTs and SPBC in patients with metastatic breast cancer (MBC) derived from the Austrian Study Group of Medical Tumor Therapy (AGMT) MBC-Registry.

Patients and methods

The AGMT_MBC-Registry is a multicenter nationwide ongoing retrospective and prospective registry for MBC patients in Austria.

Inclusion criteria for this analysis:

- documented information about SPTs and SPBC, respectively
- documented tumor localization and time of diagnosis

Results

Secondary Primary Tumors (SPT)

As of June 27, 2024, the registry included 2,850 patients. Among 2,630 evaluable patients, 225 (8.6%) were diagnosed with a secondary primary tumor (SPT), with 12% (27/225) of these having more than one SPT (**Figure 1**). A total of 260 malignancies were reported: 88% (229/260) were solid tumors and 12% (31/260) hematologic malignancies (**Table 1**, **Table 2** and **Figure 3**).

Figure 3. *Percentage and distribution of SPT.*

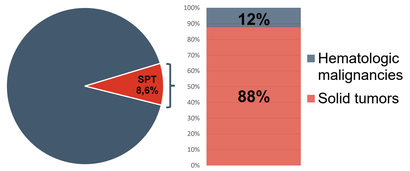


Table 1. *SPT: solid tumors.*

Solid tumors (n = 229)	n (%)
Colorectal cancer	31 (13.5%)
Melanoma	29 (12.7%)
Lung cancer	22 (9.6%)
Renal cell carcinoma	20 (8.7%)
Ovarian cancer	16 (7.0%)
Thyroid cancer	14 (6.1%)
Cervical cancer	11 (4.8%)
Bladder cancer	8 (3.5%)
Endometrial cancer	7 (3.1%)
Gastric cancer	7 (3.1%)
Pancreatic cancer	6 (2.6%)
Urothelial carcinoma	4 (1.7%)
Vulvar cancer	4 (1.7%)
Head and neck cancers	3 (1.3%)
Neuroendocrine tumors	3 (1.3%)
Prostate cancer	3 (1.3%)
Unknown	3 (1.3%)
Other	38 (16.6%)

Table 2 *SPT: hematologic malignancies.*

Hematologic malignancies (n = 31)	n (%)
Non-Hodgkin lymphoma (NHL)	7 (22.6%)
Acute leukemia	4 (12.9%)
Hodgkin lymphoma	4 (12.9%)
Myeloproliferative neoplasms	3 (9.7%)
Chronic lymphocytic leukemia (CLL)	2 (6.5%)
Myelodysplastic syndrome (MDS)	2 (6.5%)
Unknown	2 (6.5%)
Other	7 (22.6%)

Timing of Secondary Events

Figure 5. *Cumulative incidence of SPT and SPBC events before, simultaneous and after diagnosis of first primary breast cancer.**

Number of events	SPT n = 253*	SPBC n = 672
before BC	91 (36.0%)	NA
synchronous	33 (13.0%)	108 (16.1%)
after BC	129 (51.0%)	564 (83.1%)

* 7 events without sufficient data

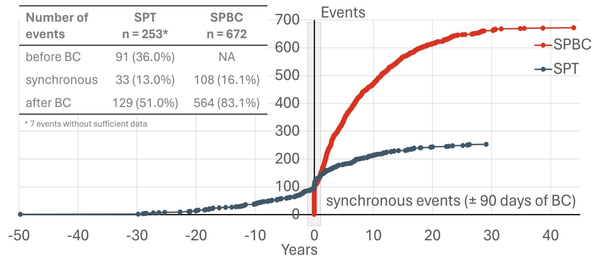
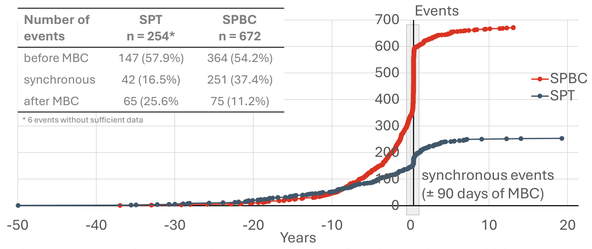


Figure 6. *Cumulative incidence of SPT and SPBC events before, simultaneous and after diagnosis of metastatic breast cancer (MBC).**

Number of events	SPT n = 254*	SPBC n = 672
before MBC	147 (57.9%)	364 (54.2%)
synchronous	42 (16.5%)	251 (37.4%)
after MBC	65 (25.6%	75 (11.2%)

* 6 events without sufficient data



* one patient can have more than one event, therefore the numbers are higher

Figure 1. *Consort diagram for secondary primary tumors (SPT).*

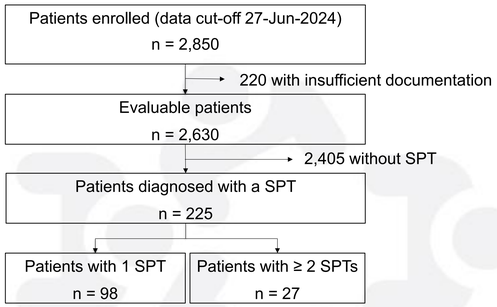
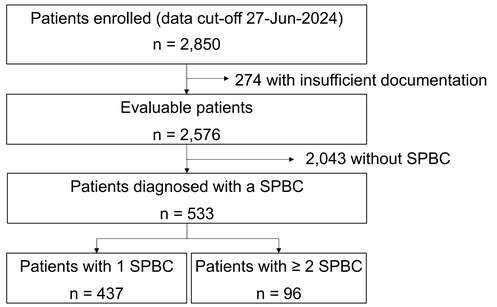


Figure 2. *Consort diagram for secondary primary tumor (SPBC).*



Second Primary Breast Cancer (SPBC)

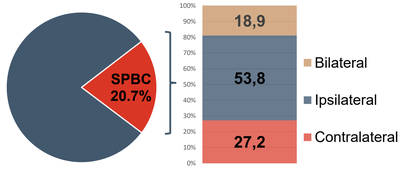
Among 2,576 evaluable patients, 533 (20.7%) were diagnosed with a SPBC, with 18% (96/533) of these having more than one SPBC event (**Figure 2** , **Table 3** and **Figure 4**). No distinction was made between local recurrences and ipsilateral SPBC.

Table 3. *SPBC diagnoses.*

SPBC events (n = 533)	N (%)
Bilateral breast cancer*	101 (18.9%)
Ipsilateral SPBC **†	287 (53.8%)
Contralateral SPBC**	145 (27.2%)

* diagnosis within 90 days
** ipsilateral BC >90 days after initial diagnosis
†or local recurrence

Figure 4. *Percentage and distribution of SPBC.*



Conclusion

In this real-world analysis of patients with MBC, about 9% were diagnosed with SPT and 21% experienced a SPBC. These findings highlight the critical role of histopathological verification of suspicious lesions and metastases and underscore the importance of continued awareness for SPTs – not only among BC survivors but also in patients with metastatic disease.

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