# PS1-09-27 (923 ): Breast Cancer and Brain Metastases: A 13-Year Single-Centre Experience in a Diverse UK Population

S. Goyal[1], F. Mutamba[1], M. Aamir[1], A. Tucker[1], E. Hurley[2], K. Sampson[1], B. Varadhan[1], L. Balakrishnan[1], S. Ahmed[1], O. Ayodele[1]
[1]University Hospitals of Leicester NHS Trust, UNITED KINGDOM, [2]Ledidi, Oslo, NORWAY.

## Introduction

**Background:**
Brain metastases (BM) affect approximately 30–35% of patients with metastatic breast cancer (MBC), significantly worsening prognosis and quality of life[1]. Although therapeutic options have expanded, real-world UK data describing the patterns of BM and their association with tumour subtypes and outcomes remain limited.

**Objectives:**
To characterise the clinicopathological features, treatment patterns, and survival outcomes of patients with breast cancer and BM at a single UK centre over a 13-year period, with a focus on breast cancer subtype distribution and associated prognoses.

| Patient demographics and Characteristics | |
|---|---|
| **Age** | |
| Median — yr | 56 |
| <65 yr — no. (%) | 171 (69.2) |
| ≥65 yr — no. (%) | 76 (30.7) |
| **Race — no. (%)** | |
| White | 200 (81) |
| Asian | 34 (13.8) |
| Black | 7 (2.8) |
| Other | 6 (2.4) |
| **Brain metastasis Denovo or recurrence — no. (%)** | |
| Denovo | 23 (9.3) |
| Recurrence | 207 (83.8) |
| Unknown | 17 (6.9) |
| **Symptomatic brain metastasis — no. (%)** | |
| Yes | 211 (85.4) |
| No | 21 (8.5) |
| Unknown | 15 (6.1) |
| **Modality of initial diagnosis — no. (%)** | |
| MRI | 97 (39.3) |
| CT | 139 (56.3) |
| Unknown | 11 (4.5) |
| **Brain only disease — no. (%)** | |
| Yes | 30 (12.1) |
| No | 217 (87.9) |
| **Lines of SACT received** | |
| Median | 2.0 |
| Maximum | 7 |
| Minimum | 0 |

**Table 1. Patient Demographic and Clinical Characteristics.**

## Methods

This was a retrospective study of 261 female patients enrolled in the University Hospitals of Leicester NHS Trust brain metastasis registry between December 2011 and December 2024. Patients were included if imaging confirmed brain metastases; 14 were excluded due to incomplete or non-confirmatory imaging. Clinical data were extracted via manual review of electronic records. Subtypes were defined per ASCO/CAP guidelines (ER/HER2 status). Descriptive statistics were used to summarise baseline characteristics. Overall survival (OS) from BM diagnosis was calculated using medians and interquartile ranges (IQR), and statistical comparisons across subtypes were performed.

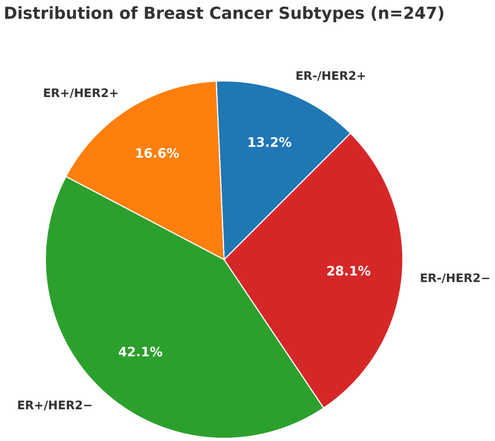



**Figure 1- Distribution of Breast Cancer subtypes (n=247)**

## Results

The final cohort included 247 patients. Median age was 56 years. Ethnic distribution: 81% White, 14% Asian, 3% Black. Most patients (85%) presented symptomatically; 88% had concurrent extracranial disease (74% visceral; 67% bone). Initial imaging: CT (56%), MRI (39%). Subtype breakdown: ER+/HER2– (40.5%), ER–/HER2– (27%), ER+/HER2+ (16%), ER–/HER2+ (12.7%).
Median OS from BM diagnosis was 17 weeks (IQR 5–42). Survival varied significantly by subtype (p<0.01):
ER–/HER2+ (40.5 weeks)
ER+/HER2+ (31 weeks)
ER+/HER2– (14 weeks)
ER–/HER2– (9 weeks)

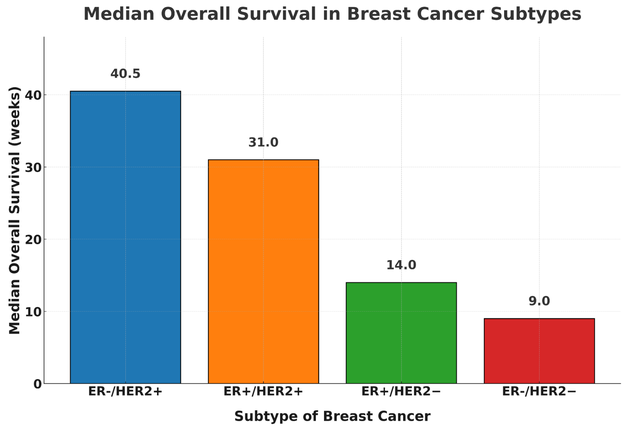



**Figure 2: Median overall survival in weeks**

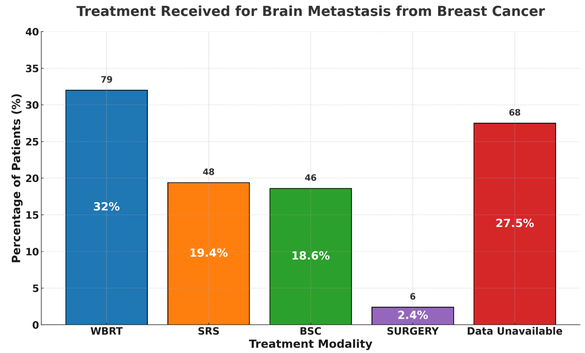



**Figure 3: Types of treatment received for brain metastasis**

**Treatments received:**
Patients received a median of two systemic treatment lines (IQR 1–3; maximum 7). Whole-brain radiotherapy (WBRT) was the most common treatment (32%), followed by stereotactic radiosurgery (SRS) in 19.4%; treatment data were unavailable for 27.5%.

## Conclusion

**Conclusions:**
In this large single-centre UK cohort, ER+/HER2– was the most frequent subtype, while ER–/HER2– was associated with the poorest prognosis. HER2+ subtypes showed superior outcomes, reflecting improved therapeutic options. These findings support the need for earlier brain surveillance in high-risk subtypes and underscore brain metastases as an area of unmet need in breast cancer management.

## Contact

Dr Sunil Goyal, MRCP
University Hospitals of Leicester NHS trust
Email sunil.goyal2@nhs.net:
Website: https://www.uhleicester.nhs.uk/
Phone: +44 116 254 1414

## References

1. Akshara S. Raghavendra et al. Breast Cancer Brain Metastasis: A Comprehensive Review. JCO Oncol Pract 20, 1348-1359(2024). DOI:10.1200/OP.23.00794

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