

Supplementary table1. Clinicopathological features, treatments and outcome data of patients with brain parenchyma metastases from cervical carcinoma documented in the literature.

| Author          | BMs(N)   | Incidence | Histotype (N)    | FIGO stage (N)                   | Interval Cx to BM (mo) | Other metastases        | Median age (yrs) | Single BM/<br>Multiple BMs (N) | Most common symptoms                                    | Site of BM                 | Treatments    | Median survival (months) |
|-----------------|----------|-----------|------------------|----------------------------------|------------------------|-------------------------|------------------|--------------------------------|---|----------------------------|---------------|--------------------------|
| Buchsbaum 1972  | 1        |           | SCC (poorly)     | IB                               | 0                      | No                      | 34               | Single                         | Headache, tinnitus,                                     | cerebrum                   | Surg+CT       | NA                       |
| Peeples 1976    | 2/644    | 0.31%     | NA               | NA                               | NA                     | NA                      | NA               | NA                             | NA  | NA                         | NA            | NA                       |
| van Nagell 1979 | 4/526    | 0.76%     | NA               | NA                               | NA                     | NA                      | NA               | NA                             | NA  | NA                         | NA            | NA                       |
| Lefkowitz 1983  | 3        |           | SCC (moderately) | IIIB                             | 7                      | Yes(lung)               | 29               | Multiple                       | Seizure, hemiparesis, paresthesia                       | cerebrum                   | WBRT          | NA                       |
|                 |          |           | SCC (poorly)     | NA                               | 12                     | No                      | 31               | Single                         | Headache, diplopia,<br>mandibular pain, facial numbness | cerebrum                   | Surg+WBRT+CT  | NA                       |
|                 |          |           | ASC (moderately) | NA                               | 39                     | Yes (bone, lung, vulva) | 68               | Single                         | confusion, speech disturbances,<br>right hemiparesis    | cerebrum                   | WBRT          | NA                       |
| Friedman 1983   | 1        |           | NA               | IB                               | 0.25                   | No                      | NA               | NA                             | NA  | NA                         | NA            | NA                       |
| Gaze 1989       | 1        |           | SCC (poorly)     | IIIB                             | 60                     | Yes(pelvis)             | 32               | Single                         | NA  | cerebrum                   | Surg+WBRT     | 18                       |
| Saphner 1989    | 6/1,219  | 0.49%     | NA               | NA                               |                        | NA                      | NA               | NA                             | NA  | NA                         | NA            | NA                       |
| Kumar 1992      | 2        |           | AC               | IIIB                             | 48                     | No                      | 48               | Multiple                       | Headache, hemiparesis, facial<br>palsy                  | cerebrum                   | WBRT+CT       | 2                        |
|                 |          |           | SCC              | IIB                              | 50                     | Yes (cervical LN)       | 50               | Single                         | Headache, impaired memory                               | cerebrum                   | Surg+WBRT     | 7                        |
| Fagundes 1992   | 18/1,211 | 1.49%     | NA               | I (4), II (3)<br>III (5), IV (6) | NA                     | NA                      | NA               | NA                             | NA  | NA                         | NA            | NA                       |
|                 |          |           |                  |                                  |                        |                         |                  | Single (6)                     | Motor weakness, headache,                               | Cerebrum (10)              | Steroids (11) | total 4                  |
| Cormio 1996     | 14/1,184 | 1.18%     | NA               | NA                               | 18                     | NA                      | 52               | Multiple (8)                   | seizures, dizziness, visual<br>disturbance              | cerebellum (2)<br>both (2) | RT (3)        | (1-21)<br>RT 2,6,21      |
| Robinson 1997   | 1        |           | SCC (poorly)     | IIIB                             | 24                     | No                      | 68               | Single                         | Dizziness, headache, ataxia                             | cerebellum                 | Surg+WBRT     | 72                       |
| Salpietro 1998  | 1        |           | SCC              | NA                               | 24                     | Yes (lung, hilar LN)    | 44               | Single                         | NA  | cerebrum                   | Surg          | 3                        |
| Senapati 1998   | 1        |           | SCC (poorly)     | IB                               | NA                     | Yes(lung)               | 45               | Single                         | Headache, vomiting, hemiparesis                         | cerebrum                   | Surg+WBRT     | NA                       |

|                       |   |                      |          |            |                          |         |              |                                   |              |                |                   |
|-----------------------|---|----------------------|----------|------------|--------------------------|---------|--------------|-----------------------------------|--------------|----------------|-------------------|
|                       |   | SCC (poorly) (4)     | IB1(2),  |            | Yes (8)                  |         |              |                                   |              | total 4.1      |                   |
| Ikeda 1998            | 8 | SCC (moderately) (1) | IB2(1)   | 24.6       |                          | 56.5    | Single (4)   | Hemiparesis, headache,            | cerebrum     | Surg+WBRT (3)  | (1.8-22.6)        |
|                       |   | AC (poorly) (2),     | IIB (4)  | (6.1-61.8) | (lung (2), bone (3),     | (36-73) | Multiple (4) | vomiting, seizure                 |              | WBRT (5)       | Surg+WBRT         |
|                       |   | UD (1)               | IIIB (1) |            | skin (1), LN (3))        |         |              |                                   |              |                | 7.5(4.1,7.5,10.3) |
| Ziainia 1999          | 1 | SCC (poorly)         | IIB      | 4          | Yes (para-aortic LNs)    | 38      | Single       | Hemiballism                       | cerebrum     | WBRT           | 4                 |
| Cormio 1999           | 1 | SCC                  | IB       | 29         | Yes (pelvic wall, lung,  | 51      | Single       | Headache, confusion, dizziness    | cerebrum     | Surg+CT        | 10                |
| Cormio 2000           | 1 | NA                   | NA       | 45         | Yes(lung)                | 42      | Single       | NA                                | cerebrum     | SRS            | 30                |
| Mahmoud-Ahmed<br>2001 | 6 | SCC (3)              | IB (1)   |            | Yes (5)                  |         |              |                                   |              | WBRT (3)       | total 7.75        |
|                       |   | ASC (2)              | IIIB (2) | 7.25       | (LN (2), lung (3), ribs  | 42      | Single (2)   | Headache                          | cerebrum (4) | Surg+WBRT (1)  | (0.5-22.5)        |
|                       |   | AC (1)               | IVB (1)  | (0-18.5)   | (3))                     | (39-69) | Multiple (4) |                                   | both (2)     | SRS (1)        | Surg+WBRT         |
|                       |   |                      |          |            |                          |         |              |                                   |              | SRS+WBRT (1)   | 10.5              |
|                       |   |                      |          |            |                          |         |              |                                   |              |                | SRS 7, 22.5       |
| Omari-Alaoui 2003     | 2 | SCC (undiff)         | IB       | 8          | Yes (liver, lung, bone)  | 48      | Single       | Headache, vomiting, cerebellar    | cerebellum   | Surg+WBRT      | 8                 |
|                       |   | SCC (poorly)         | IIB      | 9          | No                       | 67      | Multiple     | Increased ICP, cerebellar signs   | cerebellum   | WBRT           | 2                 |
| Tajran 2003           | 1 | AC                   | IB       | 96         | Yes (Vagina, lung)       | 59      | Single       | Headache                          | cerebrum     | WBRT           | 4.5               |
| Salvati 2004          | 1 | SCC (poorly)         | NA       | 54         | NA                       | 48      | Single       | Arm focal seizure                 | cerebrum     | Surg+WBRT+CT   | 11                |
| Amita 2005            | 1 | SCC (poorly)         | IIA      | 46         | No                       | 54      | Single       | Decreased visual fields, ataxia   | cerebrum     | Surg+WBRT      | 6                 |
|                       |   |                      |          |            |                          |         |              | vomiting, headache                |              |                |                   |
| Nagar 2005            | 1 | AC (moderately)      | IIA      | 9          | Yes (omentum)            | 72      | Multiple     | Headache, hemiparesis             | both         | WBRT+ steroids | 0.5               |
| Cordeiro 2006         | 3 | AC                   | IIB      | -0.25      | No                       | 60      | Single       | None                              | cerebrum     | Surg           | NA                |
|                       |   | SCC (poorly)         | NA       | NA         | Yes (lung)               | 31      | Single       | Headache, hemianopsia             | cerebrum     | Surg+WBRT      | 60                |
|                       |   | AC (poorly)          | NA       | 24         | Yes (abdomen)            | 31      | Single       | Headache, drowsiness,             | cerebellum   | WBRT           | 1                 |
|                       |   |                      |          |            |                          |         |              | visual deficits, diplopia, ataxia |              |                |                   |
| Gaussmann 2006        | 1 | SCC (poorly)         | I        | 36         | Yes (lung, pleura, bone, | 36      | Single       | Gait disturbances                 | cerebrum     | Surg+WBRT      | 120               |
|                       |   |                      |          |            | skin, mediastinal LNs)   |         |              |                                   |              |                |                   |
| Portera 2006          | 1 | SCC                  | NA       | 156        | Yes                      | 43      | Single       | NA                                | cerebrum     | WBRT+CT+ SRS   | 2.25              |
|                       |   |                      |          |            | (retroperitoneal,        |         |              |                                   |              |                |                   |

|                |         |       |                  |               |            |                              |         |              |  |          |                            |                         |            |
|----------------|---------|-------|------------------|---------------|------------|------------------------------|---------|--------------|--|----------|----------------------------|-------------------------|------------|
|                |         |       |                  |               |            | paratracheal<br>cervical LN) |         |              |  |          |                            |                         |            |
|                |         |       |                  | IB1 (5)       |            | Yes (11) No (1)              |         | Single (4)   |  |          | WBRT+steroids (8)          |                         |            |
| Chura 2007     | 12      | 0.77% | SCC (8)          | IB2 (1)       | 17.5       | (chest (8), pelvis (7)       | 44.5    | Multiple (6) | Headache, confusion,                                     | cerebrum | Surg+WBRT (1)              | 2.3                     |            |
|                |         |       | AC (4)           | IIB (3), IIIA | (1.1-96.1) | abdomen (6), bone (4)        | (31-58) | NA (2)       | seizures, paralysis                                      |          | Steroids (3)               | (0.3-7.9)               |            |
|                |         |       |                  | IIIB, IVB     |            |                              |         |              |  |          |                            |                         |            |
| Agrawal 2007   | 1       |       | SCC (moderately) | IIB           | 36         | No                           | 49      | Multiple     | Hemiparesis, headache, vomiting                          | cerebrum | Surg                       | NA                      |            |
| Brown 2007     | 1       |       | ASC (poorly)     | IB2           | 0.5        | No                           | 60      | Single       | Dysmetria, hemianopsia,<br>confusion                     | cerebrum | SRS+CT                     | 5                       |            |
| Ogawa 2008*    | 7/1,716 | 0.40% | NA               | NA            | NA         | NA                           | NA      | NA           | NA   | NA       | NA                         | 2.8                     | (0.7-28.4) |
| Growdon 2008*  | 3       |       | NA               | NA            | NA         | NA                           | NA      | NA           | NA   | NA       | NA                         | 3.5                     | (1-7.5)    |
| Rades 2009*    | 9       |       | NA               | NA            | NA         | NA                           | NA      | NA           | NA   | NA       | WBRT                       | NA                      |            |
| Peters 2010    | 1       |       | SCC              | IIIB          | NA         | Yes (lung)                   | 38      | Single       | Seizures, slurred speech<br>expressive aphasia, weakness | cerebrum | Surg                       | NA                      |            |
| Ding 2010      | 1       |       | SCC (moderately) | IB2           | 6          | Yes (spinal cord)            | 39      | Single       | Headache   | cerebrum | Surg+WBRT                  | NA                      |            |
| Park 2010      | 1       |       | SCC (poorly)     | IB2           | 30         | Yes (left SCLN)              | 48      | Multiple     | Headache, dizziness                                      | both     | WBRT+steroids              | 6                       |            |
| Menendez 2012* | 2       |       | NA               | NA            | NA         | NA                           | 42      | Single       | NA   | NA       | Surg+SRS (1)<br>SRS+CT (1) | 5                       |            |
| Setoodeh 2012  | 2       |       | SCC (poorly)     | IVB           | 0          | Yes (liver, lung)            | 53      | Single       | Aphasia, hemiparesis                                     | cerebrum | Surg                       | Died<br>postoperatively |            |
|                |         |       | SCC (poorly)     | IVB           | 0          | Yes (lung, bone)             | 43      | Multiple     | Headache   | cerebrum | Surg+WBRT+CT               | NA                      |            |
| Marongiu 2012  | 2       |       | SCC (poorly)     | IIIB          | 54         | No                           | 48      | Single       | Focal seizure  | cerebrum | WBRT+CT                    | 11                      |            |
|                |         |       | SCNEC            | IIB           | 18         | No                           | 34      | Single       | None   | cerebrum | Surg                       | 11                      |            |
| Lan-Fang 2012  | 4       |       | SCNEC            | NA            | NA         | NA                           | NA      | NA           | NA   | NA       | NA                         | NA                      |            |
| Yuan 2012*     | 6       |       | NA               | NA            | NA         | NA                           | NA      | NA           | NA   | NA       | NA                         | NA                      |            |
| Azimirad 2013  | 1       |       | SCC (poorly)     | IIB           | 24         | Yes<br>(bladder, ureter      | 49      | Single       | Altered mental status                                    | cerebrum | No                         | few days                |            |

|                         |          |       |                    |             |                      |         |               |  |                                  |                |                   |            |
|-------------------------|----------|-------|--------------------|-------------|----------------------|---------|---------------|--|----------------------------------|----------------|-------------------|------------|
|                         |          |       |                    |             | vaginal stump        |         |               |  | resting tremor                   |                |                   |            |
|                         |          |       |                    |             | rectum, colon        |         |               |  | rigidity, bradykinesia           |                |                   |            |
|                         |          |       |                    |             | abdominal wall)      |         |               |  |                                  |                |                   |            |
|                         |          |       |                    | IB (4), IIA |                      |         |               |  |                                  |                |                   |            |
|                         |          |       |                    | (3)         | Yes (11), No (2)     |         |               |  | Headache, weakness,              |                |                   |            |
| Chung 2013              | 13       |       | SCC (7), Small (3) | 38          | (Lung (8), bone (2)  | 50      | Single (4)    |  | dizziness, seizures              | both           | SRS (7)           | 4.6        |
|                         |          |       | AC (1), NA (2)     | (8.7-127.2) | abdomen (2), LN (1)) | (31-79) | Multiple (9)  |  | disturbed consciousness          |                | SRS+WBRT (6)      | (1.9-15.9) |
|                         |          |       | NA (3)             |             |                      |         |               |  |                                  |                |                   |            |
|                         |          |       | IB (1), IIB        |             | Yes (11)             |         |               |  |                                  |                |                   |            |
|                         |          |       | (2)                |             | (lung (8), liver (4) |         | Single (2)    |  | Headache, left hemiparesia       |                | CT (1), WBRT (6)  |            |
| Hwang 2013              | 11/2,458 | 0.45% | SCC (5), AC (3),   | 15.4        | bone (2), SCLN (4)   | 50      | Multiple (8)  |  | aphasia, seizure, confusion      | cerebrum (5)   | SRS+CT (1)        | 5.9        |
|                         |          |       | ASC (1), Small (2) | (3.4-83.3)  | mediastinal LN (2),  | (33-75) | NA (1)        |  | RUE weakness                     | cerebellum (6) | WBRT+CT (1)       | (0.7-19)   |
|                         |          |       | IVB (3)            |             | para-aortic LN (1)   |         |               |  |                                  |                | Surg+WBRT (1)     |            |
|                         |          |       | NA (2)             |             |                      |         |               |  |                                  |                |                   |            |
|                         |          |       | SCC (27)           |             |                      |         |               |  |                                  |                | Surg (2)          |            |
|                         |          |       | AC (6)             |             |                      |         |               |  |                                  |                | Surg+RT (5)       |            |
|                         |          |       | ASC (2)            |             |                      |         |               |  |                                  |                | Surg+CT (1)       |            |
| Nasu 2013*              | 42       |       | NEC (1)            | 36          | Yes (35), No (7)     | 53      | Single (14)   |  | NA                               | NA             | Surg+RT+CT (2)    | 5          |
|                         |          |       | Small (4)          | (0-386)     |                      | (32-87) | Multiple (28) |  |                                  |                | RT (21)           |            |
|                         |          |       | NA (1)             |             |                      |         |               |  |                                  |                | WBRT+CT (3)       |            |
|                         |          |       |                    |             |                      |         |               |  |                                  |                | NA (6)            |            |
| Vitorino-Araujo<br>2013 | 1        |       | SCC                | NA          | Yes (scalp, skull)   | 55      | Single        |  | NA                               | cerebrum       | Surg              | Alive      |
| Shepard 2014*           | 1        |       | NA                 | 60          | NA                   | 40      | Multiple      |  | Nausea, vomiting                 | NA             | WBRT              | 16         |
| Tenjarla 2014           | 1        |       | SCC                | 0           | Yes (lung, liver)    | 45      | Multiple      |  | Cranial nerve palsy, gait ataxia | cerebellum     | WBRT+ steroids    | 1          |
| Branch 2014             | 1        |       | ASC (poorly)       | 72          | Yes (lung, cervix)   | 46      | Single        |  | Seizure                          | cerebrum       | Surg+WBRT         | Alive      |
| Erdis 2014              | 1        |       | SCC                | NA          | NA                   | 67      | Single        |  | Headache                         | cerebrum       | WBRT              | NA         |
|                         |          |       |                    |             |                      |         |               |  |                                  |                |                   |            |
| Kim 2015*               | 10       |       | NA                 | 33.1        | NA                   | 43      | Single (2)    |  |                                  | cerebrum (2)   | Surg (3), RT (10) | 8.4        |
|                         |          |       |                    | (0-84.3)    |                      | (22-70) | Multiple (8)  |  | NA                               | cerebellum (8) | CT (7)            | (6.6-10.1) |

|                 |    |   |                                     |                 |   |                  |                             |  |          |                           |   |
|-----------------|----|---|-------------------------------------|-----------------|---|------------------|-----------------------------|--|----------|---------------------------|---|
| Pyeon 2015      | 1  | SCC (poorly)                            | IIA2                                | 8               | No  | 44               | Single                      | Headache, dizziness, ataxia  | cerebrum | WBRT                      | 7   |
| Sato 2015       | 1  | SCC (poorly)                            | IIB                                 | 0<br>4          | Yes (cervix, liver,<br>lungs, mediastinal LNs)        | 50               | Multiple                    | Headache, vertigo, amnesia,<br>vomiting<br>left hemiparesis, left facial<br>paresis  | both     | Surg+WBRT+CT<br>SRS       | 7   |
| Gressel 2015*   | 6  | AC (1), SCC (3)<br>ASC (2)              | I (1)<br>II (1)<br>IV (3)<br>NA (1) | 42.5<br>(1-116) | Yes (6)<br>(lung (4), Bone (3)<br>liver (2), H&N (1)) | 52<br>(47-77)    | Single (1)<br>Multiple (5)  | NA   | NA       | WBRT (4)<br>Surg+WBRT (1) | 3(1-22)<br>WBRT 6.5<br>(2-22)<br>Surg+WBRT<br>2.0 |
| Walter 2015*    | 3  | NA                                      | NA                                  | NA              | Yes (3)   | NA               | NA                          | Headache, Ataxia<br>Altered mental status, seizures,<br>stroke   | NA       | WBRT (1) Surg (2)         | NA  |
| Cacho-Diaz 2016 | 27 | SCC (11), AC (7),<br>ASC (2), Small (7) | I (5), IIB (17)<br>III (1), IV (3)  | 46<br>(3-248)   | Yes (16) (lung (16)),<br>No (11)                      | 50±11<br>(33-70) | Single (9)<br>Multiple (14) | Headache, altered mental status,<br>weakness, ataxia,<br>nausea/vomiting, visual loss,<br>cranial nerve palsy, language<br>alteration, none, seizures<br>facial twitching, droop,<br>thumb paresthesia | NA       |                           | 8.2<br>(1-34)                                     |
| Gupta 2016      | 1  | ASC (poorly)                            | NA                                  | 0               | Yes<br>(uterus, vagina, bladder)                      | 52               | Single                      |  | cerebrum | Surg+WBRT+CT              | 6   |
| Shin 2016*      | 4  | SCC (2), Small (2)                      | NA                                  | NA              | NA  | NA               | NA                          | NA   | NA       | SRS                       | 3.5   |
| Gilani 2016*    | 4  | SCC (2), Small (2)                      | II (1), III (3)                     | 25              | NA  | NA               | NA                          | NA   | NA       | NA                        | 3   |
| Divine 2016*    | 19 | NA                                      | NA                                  | NA              | NA  | NA               | NA                          | NA   | NA       | NA                        | 23  |
| Dziggel 2016*   | 8  | NA                                      | NA                                  | NA              | NA  | NA               | NA                          | NA   | NA       | NA                        | NA  |
| Keller 2016*    | 6  | NA                                      | NA                                  | NA              | NA  | NA               | NA                          | NA   | NA       | SRS                       | NA  |
| Matsunaga 2016* | 13 | NA                                      | NA                                  | NA              | NA  | NA               | NA                          | NA   | NA       | SRS                       | NA  |
| Kim 2017*       | 2  | NA                                      | NA                                  | 99              | NA  | 38               | Single                      | NA   | Cerebrum | Surg+WBRT                 | 42  |
| Johnston 2017*  | 2  | NA                                      | NA                                  | NA              | NA  | NA               | NA                          | NA   | NA       | SRS                       | 5   |
|                 |    | NA                                      | NA                                  | 75              | NA  | 43               | Multiple                    | NA   | Cerebrum | SRS                       | 6   |

|                 |            |       |   |                                   |                 |                    |                 |                             |   |                                 |   |                     |
|-----------------|------------|-------|---|-----------------------------------|-----------------|--------------------|-----------------|-----------------------------|---|---------------------------------|---|---------------------|
| Takeshita 2017* | 18/1,046   | 1.70% | SCC (8), AC (4),<br>NEC (4), CS (1)               | I (2), II (6),<br>III (4), IV (6) | NA              | Yes (16)           | 53              | Single (8)<br>Multiple (10) | NA  | NA                              | BSC (8), RT (7)<br>Surg+RT (2)<br>RT+CT (1)                     | 2.75<br>(0.25-37.5) |
| Hayashi 2017*   | 33         |       | SCC (19), AC (8),<br>SCC (3)                      | NA                                | 33<br>(-11-114) | Yes (23), No (9)   | 58<br>(33-80)   | Single (8)<br>Multiple (25) | NA  | cerebrum (14)<br>cerebellum(15) | NA  | NA                  |
| Fetcko 2017     | 1          |       | SCC   | IIIB                              | 24              | NA                 | 75              | Single                      | decreased coordination and<br>balance                         | cerebrum                        | Surg+SRS  | 6                   |
| Rades 2017*     | 8          |       | NA  | NA                                | NA              | NA                 | NA              | NA                          | NA  | NA                              | NA  | NA                  |
| Rades 2018*     | 1          |       | NA  | NA                                | NA              | NA                 | NA              | NA                          | NA  | NA                              | NA  | NA                  |
| Janssen 2018*   | 8          |       | NA  | NA                                | NA              | NA                 | NA              | NA                          | NA  | NA                              | WBRT  | NA                  |
| Gigliotti 2018* | 2          |       | NA  | NA                                | NA              | NA                 | NA              | NA                          | NA  | NA                              | SRS   | NA                  |
| Bi 2019         | 2/1,800    | 0.10% | NEC   | IIB                               | 26              | Yes                | 46              | Single                      | Headache, vomiting, hemianopia                                | cerebrum                        | Surg+CT   | 9                   |
| Zhang 2019*     | 5          |       | SCC (4), Small (1)                                | I (1), II (1)<br>III (2), IV (1)  | NA              | NA                 | 52.8            | Single (2)<br>Multiple (3)  | Headache, altered mental status,<br>seizures, ataxia, syncope | cerebrum (3)<br>cerebellum (2)  | NA  | NA                  |
| Sadik 2019*     | 4          |       | NA  | NA                                | NA              | NA                 | NA              | NA                          | NA  | NA                              | NA  | NA                  |
| Kim 2019        | 19         | 0.68% | SCC (10), Small (4),<br>AC (3), ASC (1),<br>CS(1) | I (3), II(10),<br>III(4), IV(1)   | 19<br>(9-166)   | No(3), Yes (16)    | 54.1<br>(31-75) | Single (11)<br>Multiple (8) | NA  | NA                              | Surg+RT+CT(6)<br>RT(4), RT+CT(5)<br>CT(2), BSC(2)<br>None (153) | 6<br>(0-73)         |
| Nasioudis 2020* | 211/57,160 | 0.40% | NA  | NA                                | NA              | Yes (58), No (153) | 54              | NA                          | NA  | NA                              | WBRT (52)<br>SRS (<10)  | 4.99                |
| Gardner 2020*   | 12/541     | 2.20% | NA  | IV                                | NA              | NA                 | NA              | NA                          | NA  | NA                              | NA  | NA                  |
| Rades 2020*     | 2          |       | NA  | NA                                | NA              | NA                 | NA              | NA                          | NA  | NA                              | NA  | NA                  |

AC: adenocarcinoma, ASC: adenosquamous carcinoma, BMs: Brain metastases, CT: chemotherapy, Cx: cervical cancer, LN: Lymph nodes, NA: Not applicable, SCC: Squamous cell

carcinoma, Small: Small cell carcinoma, SRS: Stereotactic radiosurgery, Surg: Surgery, UD: Undifferentiated carcinoma, WBRT: Whole-brain radiotherapy

\*: These reports include all gynecologic malignancies. We extracted information of only cervical cancer.

Supplementary table2. Clinicopathological features, treatments and outcome data of patients with brain parenchyma metastases from endometrial carcinoma documented in the literature.

| Author                  | BMs(N)   | Incidence | Histotype<br>(N)   | Grade<br>(N) | FIGO stage<br>(N) | Interval<br>EC to BM<br>(mo) | Other<br>metastases | Median<br>age<br>(yrs) | Single BM/<br>multiple BMs<br>(N) | Most common symptoms        | Site of BM              | Treatments       | Median survival<br>(months) |
|-------------------------|----------|-----------|--------------------|--------------|-------------------|------------------------------|---------------------|------------------------|-----------------------------------|-----------------------------|-------------------------|------------------|-----------------------------|
| Salibi 1972             | 1        |           | AC                 | NA           | NA                | 6                            | No                  | 63                     | Single                            | Seizure                     | cerebrum                | Surg             | 18                          |
| Nakano 1975             | 1        |           | AC                 | NA           | NA                | 26                           | Yes                 | 77                     | Single                            | Headache                    | cerebrum                | Surg+RT          | 4                           |
| Hacker 1980             | 1        |           | AC                 | NA           | NA                | 216                          | No                  | 64                     | NA                                | Diplopia                    | NA                      | Surg             | 0.8                         |
| Turner 1982             | 1        |           | AC                 | G3           | NA                | NA                           | No                  | 83                     | Single                            | NA                          | cerebrum                | Surg             | 1                           |
| Aalders 1984            | 11/3,393 | 0.30%     | NA                 | NA           | NA                | NA                           | Yes (3)<br>No (8)   | NA                     | NA                                | NA                          | NA                      | NA               | NA                          |
| Ritchie 1985            | 1        |           | AC                 | NA           | IIIC              | NA                           | Yes                 | 61                     | Multiple                          | NA                          | cerebrum                | NA               | 4                           |
| Savage 1987             | 1        |           | AC                 | G1           | I                 | 0                            | Yes                 | 70                     | Single                            | NA                          | cerebrum                | RT               | 14                          |
| Sawada 1990             | 1        |           | AC                 | G3           | IIIC              | 1.5                          | No                  | 43                     | Single                            | Headache, diplopia          | cerebrum                | Surg+RT          | 84                          |
| Brezinka 1990           | 1        |           | AC                 | G1           | I                 | 3                            | Yes                 | 59                     | Single                            | Motor weakness              | cerebrum                | Surg             | 0.75                        |
| Kottke-Marchant<br>1991 | 3        |           | AC                 | G3           | IIIC              | -3                           | Yes                 | 59                     | Single                            | Seizure                     | cerebrum                | Surg+RT          | 37                          |
|                         |          |           | AC                 | G3           | IIIA              | 0                            | No                  | 43                     | Multiple                          | Vision changes, headache    | both                    | Surg             | 1                           |
|                         |          |           | AC                 | G3           | IIIA              | -2.5                         | No                  | 46                     | Single                            | Seizure                     | cerebrum                | Surg+RT          | 9                           |
| Thomas 1992*            | 1        |           | AC                 | NA           | I                 | 24                           | No                  | 51                     | Single                            | NA                          | cerebrum                | Surg+RT          | 84                          |
| De Porre 1992           | 11/2,293 | 0.48%     | ASC (1)<br>NA (10) | G3           | NA                | 8 (1)<br>NA (10)             | No (1)<br>NA (10)   | 67                     | Single (1)<br>NA (10)             | Vision change               | cerebrum (1)<br>NA (10) | Surg (1) NA (10) | 14, NA (10)                 |
| Wronski 1993            | 2        |           | AC                 | NA           | NA                | 22                           | Yes                 | 70                     | Multiple                          | Confusion, nausea, vomiting | cerebellum              | Surg+RT          | 5.5                         |
|                         |          |           | AC                 | NA           | NA                | 88                           | Yes                 | 60                     | Multiple                          | Confusion, headache         | both                    | RT               | 2                           |
| Ruelle 1994             | 2        |           | AC                 | G3           | NA                | 14                           | Yes                 | 64                     | Single                            | Headache, gait disturbance  | cerebellum              | Surg+RT          | 9                           |
|                         |          |           | AC                 | G3           | I                 | -0.25                        | No                  | 63                     | Single                            | Headache                    | cerebrum                | Surg+RT          | 24                          |
| De Witte* 1996          |          |           | AS                 | G3           | IIIC              | NA                           | No                  | 40                     | Single                            | NA                          | cerebrum                | Surg+RT          | NA                          |

| Author (Year)       | Cases    | Rate  | AC                | G3               | IB       | IC       | Yes                         | No              | Single         | Multiple                 | Motor             | Cerebrum       | Surg            | RT                | CT                  | SRS             | Other |  |
|---------------------|----------|-------|-------------------|------------------|----------|----------|-----------------------------|-----------------|----------------|--------------------------|-------------------|----------------|-----------------|-------------------|---------------------|-----------------|-------|--|
| Cormio 1996         | 10/1,069 | 0.90% | AC (9)            | G3 (6)           | IB (3)   | IC (2)   | 26                          | Yes (4)         | 59             | Single (6)               | Motor weakness    | Cerebrum (7)   | Surg (1)        | 1 (1-83)          |                     |                 |       |  |
|                     |          |       | ASC (1)           | NA (4)           | IIIC (1) | IV (2)   | (3-81)                      | No (6)          | (47-71)        | Multiple (4)             |                   | cerebellum (1) | Surg+RT (2)     | Surg+RT (28,83)   |                     |                 |       |  |
| De Witte 1996       | 2        |       | ASC               | NA               | NA       | 24       | No                          | 67              | Single         | NA                       | NA                | cerebrum       | Surg+RT         | 60                |                     |                 |       |  |
| Salvati 1998        | 2        |       | AC                | G3               | IA       | 10       | No                          | 48              | Single         | NA                       | NA                | cerebrum       | Surg+RT+CT      | 20                |                     |                 |       |  |
|                     |          |       | AC                | G3               | IA       | 26       | No                          | 54              | Single         | NA                       | NA                | cerebrum       | Surg+RT+CT      | 74                |                     |                 |       |  |
| Martinez-Manas 1998 | 1        |       | AC                | NA               | IIB      | 18       | No                          | 76              | Single         | Vision changes           | NA                | NA             | Surg            | 8                 |                     |                 |       |  |
| Ogawa 1999          | 2        |       | AC                | G2               | IIB      | 36       | Yes                         | 43              | Multiple       | NA                       | NA                | cerebrum       | RT              | 5                 |                     |                 |       |  |
|                     |          |       | AC                | G3               | IIB      | 18       | Yes                         | 64              | Multiple       | NA                       | NA                | both           | RT              | 3                 |                     |                 |       |  |
| Crispino 2000       | 1        |       | AC                | G3               | IC       | 12       | No                          | 57              | Single         | NA                       | NA                | cerebellum     | Surg+RT         | 3                 |                     |                 |       |  |
| Petru 2001          | 2        |       | AC                | G3               | IV       | NA       | No                          | 59              | Single         | Hemiparesis              | NA                | cerebrum       | SRS             | 171               |                     |                 |       |  |
|                     |          |       | SC                | G3               | IIIC     | NA       | No                          | 60              | Single         | Headache                 | NA                | cerebellum     | SRS             | 17                |                     |                 |       |  |
| Mahmoud-Ahmed 2002* | 10/1,391 | 0.70% | AC (7)<br>ASC (3) | NA               | IIB (1)  | 8        | Yes (7)<br>No (3)<br>NA (2) | 51<br>(48-80)   | Single (3)     | Multiple (7)             | NA                | NA             | cerebrum (8)    | SRS+RT (1)        | RT (4)              | 3.25(0.25-15.5) |       |  |
|                     |          |       |                   |                  | IIIA (1) | NA (2)   |                             |                 | IIIC (2)       |                          |                   |                | IV (4)          | cerebrum (8)      | Surg (2)            | SRS+RT(1)       |       |  |
|                     |          |       |                   |                  | IIIB (2) | IIIC (2) |                             |                 | IV (4)         |                          |                   |                | cerebellum (1)  | Surg+RT (2)       | RT(0.25,2.25,2.5,6) |                 |       |  |
|                     |          |       |                   |                  | IIIC (2) | IV (4)   |                             |                 | both (1)       |                          |                   |                | Surg+SRS+RT (1) | Surg+RT(15,15.5)  |                     |                 |       |  |
| Sewak 2002          | 1        |       | AC                | G3               | IB       | 48       | Yes                         | 63              | Single         | Dizziness, nausea        | NA                | cerebellum     | Surg+RT         | Surg+SRS+RT(11.5) |                     |                 |       |  |
| Shiohara 2003       | 1        |       | AC                | G3               | IIIA     | 0        | No                          | 48              | Single         | Headache, vision changes | NA                | cerebrum       | Surg+SRS+CT     | 6.5               |                     |                 |       |  |
| Elliot 2004         | 1        |       | AC                | G3               | IIB      | 2        | No                          | 51              | Single         | NA                       | NA                | cerebrum       | Surg+RT+CT      | 38                |                     |                 |       |  |
| Salvati 2004        | 2        |       | AC                | G2               | IA       | 48       | No                          | 62              | Single         | Hemiparesis              | NA                | cerebrum       | Surg+RT         | 30                |                     |                 |       |  |
|                     |          |       | AC                | G3               | IIIC     | -0.5     | Yes                         | 51              | Single         | Hemiparesis              | NA                | cerebrum       | Surg+RT+CT      | 9                 |                     |                 |       |  |
| Gien 2004           | 8/1,295  | 0.60% | AC (7)<br>ASC (1) | G2 (3)<br>G3 (5) | IIB (2)  | 8.5      | Yes (6)<br>No (2)           | 67.5<br>(48-82) | Single (4)     | Multiple (4)             | Motor dysfunction | NA             | cerebrum (4)    | RT (6)            | CT+RT (1)           | 34              |       |  |
|                     |          |       |                   |                  | IIIC (4) | IVB (2)  |                             |                 | cerebellum (2) |                          |                   |                | steroids (1)    |                   |                     |                 |       |  |
|                     |          |       |                   |                  | IIIC (2) | IVB (2)  |                             |                 | both (2)       |                          |                   |                |                 |                   |                     |                 |       |  |



|                   |          |       |  |                             |  |                    |                    |               |                              |                     |                                 |  |  |
|-------------------|----------|-------|--|-----------------------------|--|--------------------|--------------------|---------------|------------------------------|---------------------|---------------------------------|--|--|
| N'Kanza 2005      | 1        |       | NA                                     | NA                          | NA   | NA                 | Yes                | 61            | NA                           | Dizziness, weakness | NA                              | Surg+WBRT  | 3.5(0.25-7)<br>RT(0.5,1,2,5,5,7,7)<br>stroid(0.25)       |
| Llaneza-Coto 2006 | 1        |       | AC                                     | G3                          | IIA  | 0                  | No                 | 43            | Single                       | NA                  | cerebrum                        | Surg   | 3  |
| Lee 2006          | 1        |       | AC                                     | G3                          | IB   | 96                 | No                 | 54            | Multiple                     | Seizures            | cerebrum                        | WBRT   | 1  |
| Orru 2007         | 3/348    | 0.90% | AC                                     | G3                          | IIIC   | 17                 | No                 | 61            | Multiple                     | NA                  | cerebrum                        | Surg+RT  | 0.25   |
|                   |          |       | AC                                     | G3                          | IIIB   | 10                 | No                 | 49            | Single                       | NA                  | cerebrum                        | Surg+RT  | 64   |
|                   |          |       | AC                                     | G3                          | IIIA   | 6                  | No                 | 60            | Single                       | NA                  | cerebrum                        | RT   | 16   |
|                   |          |       |  |                             |  |                    |                    |               |                              |                     |                                 | RT (7), RT+CT (4),<br>Surg+RT (1),<br>RT+SRS (1),<br>Surg+RT+CT (3),<br>No (4) |  |
| Chura 2007        | 20/2,063 | 0.97% | AC (12)<br>ASC (2)<br>CS (3)<br>UD (3) | G1 (3)<br>G2 (6)<br>G3 (11) | IA (1) IB (2)<br>IIIA (4)<br>IIIC (4)<br>IVB (9) | 11.5<br>(0.6-73.6) | Yes (16)<br>No (4) | 64<br>(49-78) | Single (8),<br>Multiple (12) | NA                  | cerebrum (19)<br>cerebellum (6) |  | 4  |
|                   |          |       |  |                             |  |                    |                    |               |                              |                     |                                 |  | 2(0.1-39.2)<br>No(0.1,0.2,1.0,7.6)<br>RT,RT+CT(0.3-10.9) |
| Sohaib 2007       | 1/86     | 1.16% | AC                                     | NA                          | NA   | NA                 | No                 | NA            | Single                       | NA                  | NA                              | NA   | NA   |
| Monaco 2008       | 6        |       | NA                                     | NA                          | NA   | NA                 | NA                 | 60.4          | NA                           | NA                  | NA                              | SRS  | NA   |
| Ramirez 2008      | 1        |       | AC                                     | G3                          | IIB  | 12                 | No                 | 61            | Multiple                     | NA                  | cerebellum                      | RT   | 5(0.2-25)  |
| Farooq 2008       | 1        |       | AC                                     | G1                          | IVB  | -3                 | Yes                | 63            | Single                       | NA                  | cerebrum                        | Surg   | 17   |
| Al-Mujaini 2008   | 1        |       | AC                                     | NA                          | NA   | 84                 | Yes                | 69            | Multiple                     | NA                  | cerebrum                        | NA   | NA   |
| Growdon 2008*     | 12       |       |  | G1 (1)<br>G2 (2)<br>G3 (8)  | I (2) II (3)<br>III (4) IV (3)                   | NA                 | NA                 | NA            | NA                           | NA                  | NA                              | NA   | NA   |
| Ogawa 2008*       | 4/556    | 0.70% | NA                                     | NA                          | NA   | NA                 | NA                 | NA            | NA                           | NA                  | NA                              | NA   | 4  |
| Rades 2009*       | 11       |       | NA                                     | NA                          | NA   | NA                 | NA                 | NA            | NA                           | NA                  | NA                              | WBRT   | 4.3(3.1-4.9)   |
| Forster 2011      | 1        |       | AC                                     | NA                          | I  | 108                | Yes                | 58            | Multiple                     | NA                  | cerebrum                        | Olaparib   | NA   |
|                   |          |       |  |                             |  |                    |                    |               |                              |                     |                                 | SRS (4),<br>WBRT+SRS (1)<br>CT (3)   | 18   |
| Menendez 2012*    | 5        |       | NA                                     | NA                          | NA   | NA                 | NA                 | 66            | NA                           | NA                  |                                 |  |  |

|                          |    |         |    |                 |          |          |             |               |                                |    |               |                   |             |
|--------------------------|----|---------|----|-----------------|----------|----------|-------------|---------------|--------------------------------|----|---------------|-------------------|-------------|
| Yuan 2012*               | 5  | NA      | NA | NA              | NA       | NA       | NA          | NA            | NA                             | NA | NA            | 13                |             |
|                          |    | AC (29) |    |                 |          |          |             |               |                                |    | Surg (1)      |                   |             |
|                          |    | ASC (1) |    | I (10) II (2)   | 25.2 ±   |          |             | Single (17)   |                                |    | Surg+RT (7)   |                   |             |
| Nasu 2013*               | 39 | CS (4)  | NA | III (12) IV     | 32.2     | Yes (30) | 60.9 ± 9.4  | Single (17)   |                                | NA | NA            | Surg+CT (1)       | 6.2         |
|                          |    | LS (4)  |    | (15)            | (0-156)  | No (9)   | (39.8-77.9) | Multiple (22) |                                |    |               | RT (18)           |             |
|                          |    | UD (1)  |    |                 |          |          |             |               |                                |    |               | RT+CT (2), CT (3) |             |
|                          |    |         |    |                 |          |          |             |               |                                |    |               | No (7)            |             |
| Gulsen and Terzi<br>2013 | 1  | AC      | G3 | III             | 27       | No       | 71          | Multiple      |                                | NA | cerebellum    | Surg+WBRT+CT      | 9           |
| Colmenar Romero<br>2013  | 1  | AC      | G3 | I               | 0        | No       | 76          | Single        |                                | NA | cerebrum      | Surg+WBRT         | 2.5         |
| Yoshida 2013*            | 1  | AC      | G1 | I               | NA       | No       | NA          | Single        |                                | NA | NA            | Surg+WBRT         | 48          |
| Nassir 2014              | 1  | AC      | G2 | II              | 24       | No       | 72          | Single        |                                | NA | cerebrum      | Surg+WBRT         | 13          |
| Shepard 2014*            | 6  | NA      | NA | NA              | 8        | NA       | 77          | Single        | Seizure, altered mental status |    | cerebrum      | SRS               | 16          |
|                          |    |         |    | III             | 36       | NA       | 32          | Single        | Syncope, blurry vision         |    | cerebellum    | SRS               | 8           |
|                          |    |         |    | IV              | 21       | NA       | 44          | Multiple      | Arm weakness                   |    | cerebrum      | SRS               | 5           |
|                          |    |         |    | IV              | 34       | NA       | 52          | Single        | Dysarthria                     |    | cerebrum      | WBRT              | 14          |
|                          |    |         |    | I               | 29       | NA       | 68          | Multiple      | Leg paresthesia                |    | cerebrum      | WBRT              | 6           |
|                          |    |         |    | I               | 13       | NA       | 79          | Single        | Altered mental status          |    | cerebrum      | Surg              | 4           |
| Sierra 2015              | 1  | AC      | G3 | III             | 12       | No       | 55          | Single        |                                | NA | cerebrum      | Surg+WBRT+CT      | 8           |
|                          |    | AC (17) |    |                 |          |          |             |               |                                |    |               |                   | 4           |
|                          |    | SCC (1) |    | I (1) II (2)    |          |          |             | Single (8)    |                                |    |               | Surg (1),         | Surg 30     |
| Gressel 2015*            | 22 | ASC (1) | NA | III (6) IV (12) | 9.5      | Yes (17) | 56.6        | Multiple (14) |                                | NA | NA            | RT (15)           | RT 4        |
|                          |    | CS (2)  |    | NA (1)          |          | No (5)   |             |               |                                |    |               | Surg+RT (2)       | Surg+RT 26  |
|                          |    | LS (1)  |    |                 |          |          |             |               |                                |    |               | No (4)            | No 4        |
|                          |    | AC (17) |    | II (3) III (8)  | 27.8     |          | 58.2        | Single (11)   |                                |    | cerebrum (13) | No (2), Surg (9)  | 23.3        |
| Kim 2015*                | 19 | LS (2)  | NA | IV (8)          | (0-53.4) | NA       | (38.5-79.4) | Multiple (8)  |                                | NA | cerebellum(6) | RT (14), CT (9)   | (17.8-28.8) |
| Kouhen 2015              | 1  | AC      | G3 | I               | 24       | No       | 62          | Single        |                                | NA | cerebrum      | WBRT+CT           | 30          |



|                 |          |       |         |        |                        |             |          |      |              |                          |               |  |             |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
|-----------------|----------|-------|---------|--------|------------------------|-------------|----------|------|--------------|--------------------------|---------------|--|-------------|---------|---------|--------|---------|-------------------------|-----------------------------|---------------------|---------|---------|---------|----------------------|----------------|-------------------|-------------|----------------------------------|--------|----------------|-------------|----------|---------|------------------|----------|----|---------------|---------|-------|---------------------------------|----------------|----|----|--------|--------|--------|------------------------------|----|----|--------|--------|----------|-------------------|----|----|-------------|---------|--------|----|----|----|
| Takeshita 2017* | 12/1,040 | 1.20% | AC (10) | NA     | I (4), III (5), IV (3) | NA          | Yes (11) | 70   | Multiple (5) | NA                       | NA            | Surg+RT (3), RT (4), RT+CT (1), No (4) | 2.5(0.5-62) |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
|                 |          |       | CS (2)  |        |                        |             |          |      |              |                          |               |  |             | No (1)  | (54-78) |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
| Johnston 2017*  | 6        |       | NA      | NA     | NA                     | NA          | NA       | NA   | NA           | NA                       | NA            | NA                                     | 6(1-25)     |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
| Rades 2017*     | 14       |       | NA      | NA     | NA                     | NA          | NA       | NA   | NA           | NA                       | NA            | NA                                     | NA          |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
| Kasper 2017     | 1        |       | NA      | NA     | NA                     | NA          | NA       | NA   | NA           | NA                       | NA            | SRS                                    | NA          |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
| Janssen 2018*   | 13       |       | NA      | NA     | NA                     | NA          | NA       | NA   | NA           | NA                       | NA            | WBRT                                   | NA          |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
| Rades 2018*     | 1        |       | NA      | NA     | NA                     | NA          | NA       | NA   | NA           | NA                       | NA            | NA                                     | NA          |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
| Gigliotti 2018* | 3        |       | NA      | NA     | NA                     | NA          | NA       | NA   | NA           | NA                       | NA            | SRS                                    | NA          |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
| Moroney 2019    | 12       |       | AC (11) | G1 (1) | I (4)                  | 33          | Yes (12) | 52.5 | Single (6)   | Headache, focal weakness | cerebrum (11) | Surg+RT (2), Surg+RT+CT (2)            | 3 (1-12)    |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
|                 |          |       |         |        |                        |             |          |      |              |                          |               |  |             | ASC (1) | G2 (3)  | II (1) | (7-199) | vision changes, aphasia | Surg+RT (2), Surg+RT+CT (2) | Surg+RT, Surg+RT+CT |         |         |         |                      |                |                   |             |                                  |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
|                 |          |       |         |        |                        |             |          |      |              |                          |               |  |             |         |         |        |         |                         |                             |                     | G3 (8)  | III (3) | IVB (4) | dizziness, confusion | cerebellum (1) | RT (4), RT+CT (2) | RT, RT+CT   |                                  |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
|                 |          |       |         |        |                        |             |          |      |              |                          |               |  |             |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             | balance issues, gait disturbance | No (2) | (1,2,3,3,7,10) |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
|                 |          |       |         |        |                        |             |          |      |              |                          |               |  |             |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                | memory loss | No (1,3) |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
|                 |          |       |         |        |                        |             |          |      |              |                          |               |  |             |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             |          | AC (17) | Headache, ataxia | cerebrum | NA | NA            |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
|                 |          |       |         |        |                        |             |          |      |              |                          |               |  |             |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             |          |         |                  |          |    |               | ASC (1) | I (3) | weakness, altered mental status | cerebellum (8) | NA | NA |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
|                 |          |       |         |        |                        |             |          |      |              |                          |               |  |             |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    | CS (3) | G1 (2) | II (2) | seizures, dizziness, syncope | NA | NA |        |        |          |                   |    |    |             |         |        |    |    |    |
|                 |          |       |         |        |                        |             |          |      |              |                          |               |  |             |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    | LS (1) | G2 (2) | III (12) | numbness, aphasia | NA | NA |             |         |        |    |    |    |
|                 |          |       |         |        |                        |             |          |      |              |                          |               |  |             |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    | sarcoma (1) | G3 (20) | IV (7) | NA | NA | NA |
| NEC (1)         | NA       | NA    | NA      | NA     | NA                     |             |          |      |              |                          |               |  |             |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
|                 |          |       |         |        |                        | Sarik 2019* | 8        |      | NA           | NA                       | NA            | NA                                     | NA          | NA      | NA      | SRS    | NA      |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
|                 |          |       |         |        |                        |             |          |      |              |                          |               |  |             |         |         |        |         | Nasioudis 2020*         | 498/243785                  | 0.20%               | NA      | NA      | NA      | Yes (165)            | 61             | NA                | NA          |                                  |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
|                 |          |       |         |        |                        |             |          |      |              |                          |               |  |             |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             | No (333)                         |        |                |             |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
|                 |          |       |         |        |                        |             |          |      |              |                          |               |  |             |         |         |        |         | Mao 2020                | 105/68,922                  | 0.20%               | AC (93) | G1 (6)  | NA      | NA                   | NA             | NA                | Single (41) | NA                               | NA     | NA             | 5           |          |         |                  |          |    |               |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
|                 |          |       |         |        |                        |             |          |      |              |                          |               |  |             |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             | CS (12)  | G2 (13) | NA               | NA       | NA | Multiple (64) |         |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |
|                 |          |       |         |        |                        |             |          |      |              |                          |               |  |             |         |         |        |         |                         |                             |                     |         |         |         |                      |                |                   |             |                                  |        |                |             |          |         |                  |          |    |               | G3 (45) |       |                                 |                |    |    |        |        |        |                              |    |    |        |        |          |                   |    |    |             |         |        |    |    |    |

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AC: adenocarcinoma, ASC: adenosquamous carcinoma, BMs: Brain metastases, CS: carcinosarcoma, CT: chemotherapy, EC: endometrial cancer, LN: Lymph nodes, LS: Leiomyosarcoma,

NA: Not applicable, NEC: Neuroendocrine carcinoma, SCC: Squamous cell carcinoma, SRS: Stereotactic radiosurgery, Surg: Surgery, UD: Undifferentiated carcinoma, WBRT: Whole-brain radiotherapy

\*: These reports include all gynecologic malignancies. We extracted information of only endometrial cancer.