# SUPPLEMENTAL DATA

**Table S1.** Treatment and prognosis of 17 cases of BSO

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Age | Surgical Procedure | Approach | DFS | Recurrence | Recurrence sites | Treatment | OS |
| 1 | 25 | OC | LS | 90 | Y | pelvic peritoneum | USO + TO + debulking | 97 |
| 2 | 60 | BSO+TH+TO | AS | 4 | N |  |  | 4 |
| 3 | 51 | BSO+TH | AS | 123 | N |  |  | 123 |
| 4 | 51 | BSO+TH | AS | 118 | N |  |  | 118 |
| 5 | 56 | BSO | AS | 112 | N |  |  | 112 |
| 6 | 65 | BSO+TH | AS | 115 | N |  |  | 115 |
| 7 | 58 | BSO | LS | 65 | N |  |  | 65 |
| 8 | 40 | USO | AS | 102 | N |  |  | 102 |
| 9 | 62 | BSO+TH | AS | 87 | N |  |  | 87 |
| 10 | 48 | BSO+TH | AS | 70 | N |  |  | 70 |
| 11 | 55 | BSO+TH | AS | 66 | N |  |  | 66 |
| 12 | 60 | BSO+TH+TO | AS | 57 | N |  |  | 57 |
| 13 | 58 | BSO+TH+TO | AS | 28 | N |  |  | 28 |
| 14 | 64 | BSO+TH+TO | AS | 14 | N |  |  | 14 |
| 15 | 16 | USO | AS | 26 | N |  |  | 26 |
| 16 | 64 | BSO+TH | AS | 14 | N |  |  | 14 |
| 17 | 59 | BSO+TH+TO | AS | 7 | N |  |  | 7 |

**Table S2.** Treatment and prognosis of 6 cases of MSO

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Age | Surgical Procedure | Approach | Stage | Pathology | DFS | Recurrence | Recurrence sites | Treatment | OS |
| 1 | 28 | USO+TO+PLND+APP | AS | IA | PTC | 134 | N |  |  | 134 |
| 2 | 42 | BSO+TH+TO | AS | IA | PTC | 130 | N |  |  | 130 |
| 3 | 43 | BSO+TH+TO+PALND/PLND | AS | IA | PTC | 121 | N |  |  | 121 |
| 4 | 62 | BSO+TH | AS | IA | PTC | 53 | N |  |  | 53 |
| 5 | 35 | OC | LS | IA | PTC+PDC | 13 | Y | ovary, uterus, peritoneum, mesentery and omentum | Chemotherapy+Surgery | 20 |
| 6 | 43 | USO+TO | LS | IA | PTC | 37 | N |  |  | 37 |

OC: ovarian cystectomy; USO: unilateral salpingo–oophorectomy; BSO: bilateral salpingo–oophorectomy; TO: omentectomy; TH: total hysterectomy; APP: appendectomy; PLND: pelvic lymph node dissection; PALND: para-aortic lymph node dissection; AS: abdominal surgery, LS: laparoscopic surgery; PTC: papillary thyroid carcinoma; PDC: poorly differentiated thyroid carcinoma

**Table S3.** Treatment and prognosis of 164 patients with stage I MSO in literature.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Reference | No. | Age  (years) | Pathology | Surgical Procedure | Adjuvant  therapy | Recurrence | DFS | Recurrence  site | Surgery at recurrence | Adjuvant  therapy |
| Woodruff &  Markley  (1957) | 1 | 26 | FTC | OC | N | Y | 5y | lungs,  mediastinum | N | TT, RAI |
| Kempers  (1970) | 2 | 42 | FTC | TH + BSO | N | Y | 16y | peritoneum diaphragm, iliac, nodes, lungs | debulking surgery | TT, RAI |
|  | 3 | 46 | FTC | TH + BSO | N | Y | 7y | liver, bone | N | N |
|  | 4 | 54 | FTC + PTC | TH + BSO | N | N | 15y | N | N | N |
|  | 5 | 54 | PTC | USO | TT | N | 26y | N | N | N |
| Graff (1980) | 6 | 72 | FTC | TH + BSO +TO | N | N | 3y | N | N | N |
|  | 7 | 30 | FTC+PTC | USO | N | N | 33m | N | N | N |
| O’ Connell  (1990) | 8 | 35 | PTC+ FTC | USO | N | Y | 11y | Contralateral, ovary, peritoneum | TH + RSO + TO  (debulking) | RAI |
|  | 9 | 35 | FTC | TH + BSO | N | N | 6m | N | N | N |
| Brunskill  (1990) | 10 | 38 | FVPTC | TH + BSO + TO | N | N | 2y | N | N | N |
| Ayhan  (1993) | 11 | 66 | FTC | USO + TO | Chemotherapy | Y | 5y | ileocecal,  serosa | TH + USO+ TO + LN | Multi-Chemo-therapy |
|  | 12 | 37 | PTC | TH + USO+  TO + LN | N | N | 10y | N | N | N |
| Piura  (1995) | 13 | 65 | FTC | TH + BSO | N | N | 70m | N | N | N |
| Brenner  (1996) | 14 | 49 | FTC | USO | TT, RAI | Y | 0.8y | Urinary bladder | N | RAI |
| Berghella  (1997) | 15 | 32 | PTC | USO + TO | N | N | 2y | N | N | N |
| Doldi  (1998) | 16 | 58 | PTC | OC | N | N | 1y | N | N | N |
| Rose  (1998) | 17 | 42 | PTC + FVPTC | TH + USO + LN | N | Y | 6m | TG elevated | N | RAI |
| Dardik  (1999) | 18 | 28 | FVPTC | USO | N | Y | 2y | Fallopian tubes  Paraaortic LN | Celiotomy + TH + USO + RS +TO + paraaortic LN | TT, RAI |
|  | 19 | 39 | FTC | USO | N | Y | 0.6y | Hernia sac  Peritoneum  omentum | TH + USO + TO + tumor resection | TT, RAI |
| Bhansali  (1999) | 20 | 47 | FTC | TH + BSO | EBRT | N | 4y | N | N | N |
| Matsuda  (2001) | 21 | 48 | PTC | TH + BSO + TO + LN | N | N | 3y | N | N | N |
| Hemli  (2001) | 22 | 18 | PTC | OC | N | N | 21m | N | N | N |
| Kabukcuglu  (2002) | 23 | 52 | FVPTC | TH + BSO + TO + APP + LN | N | N | 2y | N | N | N |
| Sussman  (2002) | 24 | 53 | FVPTC | TH + BSO | N | N | 3m | N | N | N |
| DeSimone  (2003) | 25 | 32 | FTC | TH+ BSO | TT, RAI | N | 14m | N | N | N |
| Volpi  (2003) | 26 | 49 | PTC | BSO + TO + LN | N | N | 1y | N | N | N |
| Zannoni  (2004) | 27 | 66 | FVPTC | TH + BSO + TO + LN | N | N | 6m | N | N | N |
| Makani  (2004) | 28 | 46 | PTC | TH + BSO | N | N | 32m | N | N | N |
| Ihalagama  (2004) | 29 | 27 | FTC | USO | N | N | 32m | N | N | N |
| Garcia  (2005) | 30 | 22 | FTC | USO  TO + LN | N | N | 6y | N | N | N |
| Bolat  (2005) | 31 | 34 | PTC | USO + LN + TO | N | N | 7m | N | N | N |
| Zekri (2006) | 32 | 26 | FTC | USO | N | Y | 10y | Bone,  lung | N | TT, RAI |
| Doganay (2007) | 33 | 53 | PTC | TH + BSO | TT | N | 1y | N | N | N |
| Tomee (2008) | 34 | 51 | PTC | USO | N | N | 4y | N | N | N |
| Yassa (2008) | 35 | 25 | PTC | USO | thyroxine | N | 1y | N | N | N |
| Janszen (2008) | 36 | 33 | FVPTC | TH + BSO | N | Y | 3y | Liver, lymph nodes | N | TT, RAI |
|  | 37 | 52 | FTC | BSO | TT, RAI | N | 2y | N | N | N |
|  | 38 | 32 | PTC | USO | TT, RAI | N | 6m | N | N | N |
| Prasad (2008) | 39 | 40 | FTC | TH + BSO + TO | TT | N | 4y | N | N | N |
| Roth  （2008） | 40 | 34 | PTC | USO | N | N | 25y | N | N | N |
| Garg (2009) | 41 | 38 | FVPTC | OC | N | Y | 3y | Contralateral ovary,  Peritoneum,  omentum | USO + TO +peritoneum resection | TT, RAI |
|  | 42 | 34 | FVPTC | OC | N | Y | 4y | Uterine serosa, peritoneum,  diaphragm, and liver | TH + BSO + tumor excision + liver resection | TT, RAI |
|  | 43 | 32 | PTC | USO + TO + LN | N | N | 14y | N | N | N |
|  | 44 | 40 | PDC | TH + BSO + TO + LN | N | N | 1.1y | N | N | N |
|  | 45 | 42 | PTC | TH + BSO | N | N | 1y | N | N | N |
|  | 46 | 47 | PDC | TH + BSO | N | N | 5y | N | N | N |
|  | 47 | 51 | FVPTC | TH + BSO | N | N | 4y | N | N | N |
|  | 48 | 56 | FVPTC | TH + BSO | N | N | 1.3y | N | N | N |
| Wong (2009) | 49 | 44 | FVPTC | USO | TT, RAI | N | 0.5y | N | N | N |
| Yucesoy  (2010) | 50 | 40 | PTC | TH + BSO + LN | N | N | 18m | N | N | N |
| Shaco-levy  (2010) | 51 | 57 | PTC | TH + BSO | N | Y | 11m | Peritoneum, viscera, diaphragm, liver, bowels | N | Chemo-  therapy |
|  | 52 | 54 | PTC | TH + BSO + TO | N | Y | 2.8y | Local peritoneum | N | N |
| Marcy  (2010) | 53 | 45 | FVPTC | USO | N | Y | 1y | Liver, peritoneum, adrenal, lung, bone | TH + RSO + TO + LN | TT, RAI,  Chemotherapy |
| Sibio  (2010) | 54 | 74 | PTC | TH + BSO + LN | N | N | 7y | N | N | N |
| Ruel  (2010) | 55 | 42 | FVPTC +  PTC | OC | N | Y | 5y | Ovary, Lung, bone, para-aortic LN | metastases resection | TT, RAI |
| Yang  (2010) | 56 | 74 | PTC | TH + BSO | N | Y | 31m | Colon | LN + tumor resection | TT, RAI |
| Agrawal  (2010) | 57 | 36 | PTC | USO | N | N | 2y | N | N | N |
| Salman  (2010) | 58 | 67 | PTC | TH + BSO | N | N | 2y | N | N | N |
| Kraemer  (2011) | 59 | 40 | FVPTC | USO | N | N | 1y | N | N | N |
| Tanaka  (2011) | 60 | 50 | FVPTC | TH +USO | N | N | 14m | N | N | N |
| Menon  (2011) | 61 | 46 | FVPTC | TH + BSO | N | N | 3m | N | N | N |
| Meringolo  (2011) | 62 | 62 | PTC | USO | N | N | 1y | N | N | N |
| Hinshaw  (2012) | 63 | 74 | FVPTC | TH + BSO + TO + LN | N | N | 6m | N | N | N |
| Jean  (2012) | 64 | 60 | PTC | BSO + LN | TT, RAI | N | 2y | N | N | N |
| Selvaggi  (2012) | 65 | 50 | FTC | TH + BSO + TO + LN | N | N | 1y | N | N | N |
| kumar  (2012) | 66 | 35 | FVPTC | USO | N | N | 1y | N | N | N |
| Barrera  (2012) | 67 | 41 | PTC | TH + BSO | TT, RAI | N | 6m | N | N | N |
| Shrimali  (2012) | 68 | 52 | PTC | USO | TT, RAI | N | 75m | N | N | N |
|  | 69 | 53 | FTC | TH + BSO | TT, RAI | N | 60m | N | N | N |
|  | 70 | 50 | PTC | TH + BSO | TT, RAI | N | 62m | N | N | N |
|  | 71 | 35 | PTC | USO | TT, RAI | N | 17m | N | N | N |
| Lee  (2012) | 72 | 35 | FTC | OC | N | Y | 2y | Liver, peritoneum, diaphragm, right salpinx | Debulking | TT, RAI |
| Marti  (2012) | 73 | 43 | FTC | OC | N | N | 13y | N | N | N |
|  | 74 | 44 | PTC | BSO + APP | N | N | 9y | N | N | N |
|  | 75 | 57 | PTC | TH + BSO | N | N | 9y | N | N | N |
|  | 76 | 44 | PTC | TH + BSO + TO + LN | TT, RAI | N | 0.6y | N | N | N |
| Collins  (2012) | 77 | 61 | PTC | TH + BSO | Chemotherapy | Y | 30m | peritoneum | Tumor resection | TT, RAI |
| Steinman  (2013) | 78 | 35 | FVPTC | USO + LN +TO | N | Y | 11y | Left anterior  Pelvis bone | Tumor resection | TT, RAI |
| Leite  (2013) | 79 | 78 | PTC | USO | TT | N | 2y | N | N | N |
| Krishna-  Murthy  (2013) | 80 | 51 | FVPTC | TH + BSO + TO + LN | TT | N | 6m | N | N | N |
| Leong  (2013) | 81 | 42 | PTC | TH + BSO | TT, RAI | N | 1y | N | N | N |
| Mardi  (2013) | 82 | 40 | PTC | OC | N | N | 6m | N | N | N |
| Karagko  -unis  (2014) | 83 | 30 | PTC | USO + TO + LN | TT, RAI | N | 9m | N | N | N |
| Yan  (2014) | 84 | 38 | PTC | USO | N | Y | 2y | Liver, retroperitoneal  Lymph nodes | Metastases resection | TT, RAI |
| Brusca  (2014) | 85 | 30 | FVPTV | USO+ APP | TT, RAI | N | 6m | N | N | N |
| Park  (2015) | 86 | 80 | FTC | OC | N | N | 20m | N | N | N |
| Srbovan  （2015） | 87 | 62 | PTC | TH + BSO | TT, RAI | N | 5m | N | N | N |
| Cong  (2015) | 88 | 38 | FTC | USO | N | Y | 17y | lung | N | TT, RAI |
| Khunamor-  Npong  (2015) | 89 | 21 | PTC | USO+ LN, TO + APP | N | Y | 15m | Lung, spinal cord | N | TT, RAI, chemotherapy |
| Monti  (2015) | 90 | 41 | FVPTC | USO | TT, RAI | N | 2y | N | N | N |
| Fukunaga (2016) | 91 | 66 | Anaplastic carcinoma | TH + BSO | Chemotherapy | N | 25m | N | N | N |
| Lara (2016) | 92 | 36 | PTC | USO + TO | TT, RAI | N | 1y | N | N | N |
| Oudoux (2016) | 93 | 49 | FVPTC | TH + BSO + TO + LN | TT, RAI | N | 3y | N | N | N |
| Ma (2016) | 94 | 47 | FVPTC | TH + BSO | TT, RAI | N | 3y | N | N | N |
| Llueca (2017) | 95 | 43 | PTC | USO | N | N | 4y | N | N | N |
| Middelbeek (2017) | 96 | 55 | PTC | BSO | TT, RAI | N | 5y | N | N | N |
| Gomes-Lima, (2018) | 97 | 67 | PTC, | BSO | TT, RAI | N | 5y | N | N | N |
| Alamdari (2018) | 98 | 11 | FTC+FVPTC | USO | TT, RAI | N | 8m | N | N | N |
| Yasutake (2018) | 99 | 66 | PTC | TH + BSO + TO | N | N | 3m | N | N | N |
| Wu  (2018) | 100 | 48 | PTC | USO | Chemotherapy | Y | 14y | Colon, rectum, liver, spleen, peritoneum | N | TT, RAI |
| Tzelepis (2019) | 101 | 32 | FVPTC | USO + TO | TT | Y | 5m | mesenteric,  lymph nodes | N | RAI |
| Richa (2019) | 102 | 31 | FTC | USO | RAI | N | 0.5y | N | N | N |
| Hassan (2019) | 103 | 51 | PTC | TH + BSO + TO + APP+ LN | N | N | 2y | N | N | N |
| Khatchap-  Uridze  (2020) | 104 | 50 | PTC | TH + BSO + TO | TT, RAI | N | 3.8y | N | N | N |
| Gonet  (2020) | 105 | 17 | FVPTC | BSO | TT, RAI | N | 4y | N | N | N |
| Poli (2020) | 106 | 52 | PTC | TH +BSO | N | N | 4y | N | N | N |
|  | 107 | 66 | FVPTC | BSO | N | N | 6y | N | N | N |
|  | 108 | 63 | PDC | BSO | RAI | N | 8y | N | N | N |
|  | 109 | 66 | FVPTC | BSO | N | N | 12y | N | N | N |
|  | 110 | 56 | PTC | BSO | N | N | 20y | N | N | N |
|  | 111 | 77 | FVPTC | BSO | N | N | 2y | N | N | N |
| Limaiem (2020) | 112 | 75 | FTC | USO | N | N | 0.5y | N | N | N |
| Li (2020) | 113 | 39 | FTC | USO | N | Y | 9y | lung | N | TT, RAI |
|  | 114 | 34 | DTC | USO | N | Y | 2y | Peritoneum, vaginal residue | TH + USO + TO + APP | chemotherapy |
| Li (2021) | 115 | 78 | FVPTC | USO | N | N | 40m | N | N | N |
|  | 116 | 42 | PTC | USO | N | N | 5y | N | N | N |
|  | 117 | 42 | PTC | USO | Chemotherapy | N | 3y | N | N | N |
|  | 118 | 56 | PTC | USO | Chemotherapy | N | 70m | N | N | N |
|  | 119 | 44 | PTC | USO | TT | N | 6m | N | N | N |
| Ayhan (2021) | 120 | 46 | FVPTC | TH + BSO + TO + LN | TT, RAI | N | 0.83y | N | N | N |
| Seban (2021) | 121 | 71 | PTC | TH + BSO | TT, RAI | Y | 0.5y | Liver, peritoneum | N | Targeted therapy |
| Yu (2021) | 122 | 42 | FTC | USO | Chemotherapy | Y | 2y | Uterus, peritoneum, mesentery, omentum | TH + USO + TO + APP + mesentery + peritoneal nodules resection | TT, RAI, chemotherapy |
| Cheng (2021) | 123 | 48 | PTC | USO | N | N | 2y | N | N | N |
| Donato (2021) | 124 | 35 | PTC | USO | TT, RAI | N | 2.4y | N | N | N |
| Li  (2021) | 125 | 46 | FTC | TH + BSO + TO + LN | chemotherapy | N | 12y | N | N | N |
| Deng  (2022) | 126 | 40 | FTC | OC | N | Y | 5y | ovary | TH+BSO+TO | RAI |
| Elshafie  (2022) | 127 | 33 | PTC | OC | N | Y | 3y | ovary | TH+BSO | TT, RAI |
| Leustean  (2022) | 128 | 46 | FTC | TH+ BSO | TT, RAI | N | 1y | N | N | N |
| Terayama  (2022) | 129 | 62 | PTC+PDC | TH+ BSO+TO | N | N | 2y | N | N | N |
| Zhang  (2022) | 130 | 30 | PTC | OC | N | Y | 5y | Liver,  peritoneum, omentum | USO  +debulking | N |
| Abera  (2023) | 131 | 41 | FVPTC | TH+BSO+TO+APP | TT | N | 6y | N | N | N |
| Al Bashir  (2023) | 132 | 31 | PTC | OC | N | N | 60m | N | N | N |
| Al-Shammaa  (2023) | 133 | 11 | PTC | unilateral oophorectomy | N | N | 3y | N | N | N |
| Groener  (2023) | 134 | 35 | PTC | unilateral oophorectomy | RAI | N | 3y | N | N | N |
| Harrison  (2023) | 135 | 58 | PDTC | BSO | TT, RAI | N | 9m | N | N | N |
| Irena  (2023) | 136 | 48 | PTC | USO+TO+APP+LN | TT, RAI | N | 6y | N | N | N |
| Seo  (2023) | 137 | 42 | PTC | USO | TT, RAI | N | 6m | N | N | N |
| Shou  (2023) | 138 | 37 | FTC | TH+BSO+TO+APP | N | N | 3m | N | N | N |
| Yamauchi  (2023) | 139 | 50 | PTC | TH+BSO+TO | N | N | 20m | N | N | N |
| Yang  (2023) | 140 | 41 | PTC | USO | N | N | 10m | N | N | N |
| Hamdy  (2024) | 141 | 22 | FTC | USO | TT, RAI | N | 8m | N | N | N |
| Li  (2024) | 142 | 44 | PTC | USO | TT | N | 4y | N | N | N |
| Neyrand  (2024) | 143 | 35.7 | PDTC | USO | N | N | 90.1m | N | N | N |
|  | 144 | 53.6 | PDTC | USO | N | N | 49m | N | N | N |
|  | 145 | 60.2 | FVPTC | BSO | TT, RAI | N | 55.3m | N | N | N |
|  | 146 | 56.9 | FVPTC | BSO | N | N | 36.2m | N | N | N |
|  | 147 | 36.3 | FVPTC | OC | N | N | 32.8m | N | N | N |
|  | 148 | 53.9 | PTC | TH+BSO | N | N | 32.7m | N | N | N |
|  | 149 | 29 | PTC | OC | N | N | 19.3m | N | N | N |
| Obeidat  (2024) | 150 | 44 | FTC | TH+BSO | N | N | 26m | N | N | N |
|  | 151 | 46 | PTC | TH+BSO | TT, RAI | N | 12m | N | N | N |
| Rahimi  (2024) | 152 | 64 | PTC | TH+BSO | TT, RAI | N | 3y | N | N | N |
| Ryu  (2024) | 153 | 67 | FTC | TH+BSO | N | N | 156m | N | N | N |
|  | 154 | 36 | FVPTC | TH+BSO+TO | N | N | 3m | N | N | N |
|  | 155 | 56 | FTC | TH+BSO+TO | N | N | 12m | N | N | N |
|  | 156 | 33 | PTC | OC | N | N | 1m | N | N | N |
|  | 157 | 34 | FTC | TH+BSO+TO | N | N | 81m | N | N | N |
|  | 158 | 48 | PTC | TH+BSO | N | N | 88m | N | N | N |
|  | 159 | 47 | PDTC | USO+OC+TO | N | N | 72m | N | N | N |
|  | 160 | 54 | PTC | BSO | N | N | 59m | N | N | N |
|  | 161 | 30 | PTC | USO | N | N | 33m | N | N | N |
|  | 162 | 74 | PTC | TH+BSO+TO | N | N | 13m | N | N | N |
|  | 163 | 32 | PTC | USO | N | N | 7m | N | N | N |
|  | 164 | 61 | DTC | TH+BSO+TO | TT, RAI | N | 4m | N | N | N |

PTC: papillary thyroid carcinoma; FTC, follicular thyroid carcinoma; FVPTC, follicular variant of papillary thyroid carcinoma; PDC: poorly differentiated thyroid carcinoma; OC: ovarian cystectomy; USO: unilateral salpingo–oophorectomy; BSO: bilateral salpingo–oophorectomy; TO: omentectomy; TH: total hysterectomy; APP: appendectomy; LN: lymph node dissection; EBRT, external beam radiotherapy; TT, total thyroidectomy; RAI, radioiodine therapy.