Dosage
A: SRS 3.5 months after ip (n=20);
B: SRS 5.5 months within receiving ip (n=51)
Ip 3 or 10 mg/kg every 3 weeks; 50% IDL: 20 (16–24) Gv. Single fraction SRS

Survival
A: 1.34 months; B: 11.5 months (P<0.001)
LC =− 2.3 months; C: 8.43 months (P<0.001)
OS multivariate: 1.78 (95% CI 0.85–3.76, P=0.129)
NR

Gerber et al. [2014] (N=13) (30)
A: ip and WBRT within 30 days of one another (n=13);
B: external study comparison of ip alone
Ip 3 or 10 mg/kg total MD: 3,000 [2,700–3,750] Gv given in median fractions of 10 [8–15]

A: 4 months;
B: 78%;
C: 25%;
NR
NR

Matthews et al. [2013] (N=58) (38)
A: ip before RT (n=6);
B: ip concurrently with RT (n=7);
C: ip before RT (n=11);
D: RT only (n=32)
Ip 3 mg/kg every 4 weeks for 4 doses; 50% IDL: 20 [15–20] Gy. Single fraction SRS

6 months:
A: B = C: 56% D: 45% (P<0.16)
A: B + C: 63%;
D: 65% (P<0.00)
NR
No difference in incidence of new brain metastasis among all three groups (P<0.05);
6 months freedom from new brain metastasis: A + B + C: 35%;
D: 47% (P=0.48)

Kwon et al. [2014] (N=795) (37)
A: RT and ip (n=398);
B: RT only (n=400)
Ip10 mg/kg single dose of RT of 8 Gy for at least one, and up to five, bone fields

A: 11.2 months (95% CI, 9.5–12.7)
B: 10.2 months (95% CI, 8.3–11.3)
NR
NR
Progression free survival—
A: 4.0 months [95% CI, 3.6–4.3]
B: 4.1 months [95% CI, 3.5–4.4] (P=0.0017)

Tat et al. [2014] (N=31) (39)
A: positive brain metastasis (received SRS and ip) (n=11);
B: negative brain metastasis (received SRS and ip) (n=21)
NR
A: 19.8 months (95% CI, 15.1–24 months— not yet reached upper limit)
B: 21.3 months (95% CI, 17.7 months—not yet reached upper limit)
NR
NR
NR

Proportions of CD8+ cells (those who had increased CD8+ cells had increased clinical benefit) expressing ICOS—
A: 25%;
B: 15%;
GPR—A: 6.5% B: 1.6%;
LAG3—A: 3.3% B: 1.1%.
All P<0.05

Gaudy-Marqueste et al. [2017] (N=179) (44)
A: GK and ICPI (n=70);
B: GK only (n=28);
C: BRAF mutated (n=103);
D: BRAF wild type (n=68)

A: 29.3% (95% CI, 19.1–44.4)
B: 33.1% (95% CI, 20.5–54.6)
NR
NR
NR

Linker et al. [2018] (N=63) (45)
A: concurrent ICPI and SRS (n=16);
B: sequential ICPI and SRS (n=11)
Flm 2 mg/kg 3 doses weekly or Niv 3 mg/kg 2 doses weekly;
WBRT: MD 30 Gy in 10 fractions

A: 6.4 months (P=0.00)
A: 18 months (95% CI, 15.1–24 months)
B: 8.6 months (P=0.04)
NR
NR
NR

Ahmed et al. [2010] (N=38) (46)
A: unreacted disease + multipeptide vaccine (n=19);
B: unreacted disease + multipeptide vaccine (n=7)
Niv 3 mg/kg

SRS MD: 21 Gy (n=23) and 24 Gy (n=25)

A: 6.8 months (95% CI, 3.2–10.6 months)
B: 10 months (P<0.001)
LC A and B—
6 months: 91%;
12 months: 83%

NR
NR
Rates of distant BM control in both A and B—
6 months: 66%;
12 months: 53%

Qian et al. [2015] (N=45) (47)
A: ip before RT (n=24);
B: RT before ip (n=23);
C: ip before RT (n=24);
D: RT only (n=26)
Ip 3 mg/kg;

Abative: 16 Gy/fraction, 1 fraction;
on-abative: 3 Gy/fraction, 11 fractions
C: 12.6 months (95% CI, 14.8–36.1)
D: 10.2 months (95% CI, 8.7 months to non-estimable)
NR
NR
NR

Patel et al. [2017] (N=54) (48)
A: ip before SRS (n=7);
B: RT during maintenance phase (n=11)
Ip 3 mg/kg;

Lessions up to 20 mm in diameter: 21 Gy;
21 to 30 mm in diameter: 18 Gy;
31 to 40 mm in diameter: 15 Gy;
> 40 mm in diameter fractionated RT over 3 to 5 fractions

1 year/2 year:
A: 42.9%/42.9%
B: 33.8%/18.8%
C: 92.3% D: 71.4%
(84)
NR
NR

Tang et al. [2017] (N=35) (49)
A: RT to liver (n=15);
B: RT to lung (n=14)
Ip 3 mg/kg every 4 weeks for 4 doses;
50 Gy in 4 fractions or 60 Gy in 10 fractions
NR
NR
NR

Proportions of CD8+ cells (those who had increased CD8+ cells had increased clinical benefit) expressing ICOS—
A: 25%; B: 15%;
GPR—A: 6.5% B: 1.6%;
LAG3—A: 3.3% B: 1.1%.
All P<0.05