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| **Table 1. Search strategy used for search of databases.** |
| **Pubmed** |
| 1 | (("Arteriovenous Malformations") OR (Arteriovenous Malformation[Title/Abstract])) OR (AVM[Title/Abstract]) |
| 2 | (((((((brain\*[Title/Abstract]) OR (cerebral[Title/Abstract])) OR (intracerebral[Title/Abstract])) OR (central nervous system[Title/Abstract])) OR (intracranial[Title/Abstract])) OR (cerebellar[Title/Abstract])) OR (intraventricular[Title/Abstract])) OR (supratentorial[Title/Abstract]) |
| 3 | ((((((("Radiosurgery") OR (stereotactic radiosurgery[Title/Abstract])) OR (Gamma Knife[Title/Abstract])) OR (Linear Accelerator[Title/Abstract])) OR (LINAC[Title/Abstract])) OR (CyberKnife[Title/Abstract])) OR (Radiotherapy[Title/Abstract])) OR (Stereotactic Radiation[Title/Abstract]) |
| 4 | (("Embolization, Therapeutic") OR (Embolization[Title/Abstract])) OR (Embolotherapy[Title/Abstract]) |
|  | #1 AND #2 AND #3 AND #4 |
| **Embase** |
| 1 | ('arteriovenous malformation')/exp OR (('Arteriovenous Malformation'):ti,ab,kw) OR ((AVM):ti,ab,kw) |
| 2 | (brain\*):ti,ab,kw OR ((cerebral):ti,ab,kw) OR ((intracerebral):ti,ab,kw) OR (('central nervous system'):ti,ab,kw) OR ((intracranial):ti,ab,kw) OR ((cerebellar):ti,ab,kw) AND ((intraventricular):ti,ab,kw) AND ((supratentorial):ti,ab,kw) |
| 3 | (radiosurgery)/exp OR (('stereotactic radiosurgery'):ti,ab,kw) OR (('Gamma Knife'):ti,ab,kw) OR (('Linear Accelerator'):ti,ab,kw) OR ((LINAC):ti,ab,kw) OR ((CyberKnife):ti,ab,kw) OR ((Radiotherapy):ti,ab,kw) OR (('Stereotactic Radiation'):ti,ab,kw) |
| 4 | (Embolization):ti,ab,kw OR (('Therapeutic embolization'):ti,ab,kw) OR ((Embolotherapy):ti,ab,kw) |
| #1 AND #2 AND #3 AND #4 |

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| **Table 2. Risk of bias in the observational cohort studies using the Newcastle-Ottawa Scale.** |
| **Authors (Year)** | **Selection scores** | **Comparability score** | **Outcome score** | **Total score** |
| **Representation of exposed cohort** | **Selection of nonexposed cohort** | **Ascertainment of exposure** | **Demonstration that outcome of interest not present at start of study** | **Control for important or additional factor** | **Assessment of outcome** | **FU long enough for outcomes to occur** | **Adequacy of FU of cohorts** |
| Abecassis (2017) 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Achrol (2007) 2 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 7 |
| Al Saiegh (2022) 3 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Andrade-Souza (2007) 4 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Arai (2006) 5 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Back (2008) 6 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 6 |
| Bethanabatla (2022) 7 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Bowden (2014) 8 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Brunozzi (2022) 9 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 7 |
| Burke (2021) 10 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Chen (2021) 11 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 7 |
| Chen (2021) 12 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Chen (2020) 13 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Chen (2019) 14 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Darsaut (2011) 15 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 7 |
| Deruty (1998) 16 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Ding (2014) 17 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Ding (2014) 18 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Dumot (2022) 19 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 7 |
| Erickson (2022) 20  | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Faye (2020) 21 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Hadjipanayis (2001) 22 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Hasegawa (2022) 23 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Hasegawa (2019) 24 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 7 |
| Hirschmann (2020) 25 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Hoh (2000) 26 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Hung (2019) 27 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| Izawa (2009) 28 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Kano (2012) 29 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Kawashima (2020) 30 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Kim (2022) 31 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Lecavalier-Barsoum (2013) 32 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Lee (2015) 33 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Lindvall (2015) 34 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Link (2018) 35 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 7 |
| Loebl (2022) 36 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 7 |
| Marciscano (2017) 37 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Mariachev (2015) 38 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Meng (2021) 39 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Milker-Zabel (2012) 40 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Miyawaki (1999) 41 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 7 |
| Mohr (2020) 42 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 9 |
| Murray (2011) 43 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Nagaraja (2006) 44 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Nagy (2017) 45 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 7 |
| Nagy (2012) 46 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Naoi (2000) 47 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 7 |
| Nataraj (2014) 48 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| Nerva (2018) 49 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Oermann (2015) 50 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Paul (2014) 51 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Pedroso (2004) 52 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Pelissou-Guyotat (1997) 53 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Peres (2017) 54 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| Pulli (2019) 55 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Punyawai (2021) 56 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Rajshekhar (2016) 57 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 7 |
| Sai Kiran (2007) 58 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 7 |
| Schlienger (2000) 59 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 7 |
| Schwyzer (2012) 60 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 7 |
| Smith (1997) 61 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Soize (2014) 62 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 6 |
| Sun (2011) 63 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| Thenier-Villa (2017) 64 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Wang (2014) 65 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Winkler (2021) 66 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 7 |
| Xiao (2010) 67 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 7 |
| Yan (2021) 68 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 8 |
| Yang (2009) 69 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| Young (1997) 70 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 6 |
| FU: Follow-up |

Figure 1. Funnel plots to assess publication bias for each outcome (Eager’s regression could not be performed for outcomes with limited studies).

a) Obliteration, Eager’s P=0.07



b) Radiation induced changes, Eager’s P=0.25



c) Post-treatment hemorrhage, Eager’s P=0.13



d) Cyst formation, Eager’s P=NA



e) Mortality, Eager’s P=NA



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