**Tables**

**Table 1.** Summary of included studies

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Authors**  **Year** | **Study design** | **No. of patient** | **Chemotherapy cohort and chemotherapy regimen** **(%)** | **Type of breast reconstruction (what %flaps)** | | **Time to surgery (last dose of chemotherapy, weeks)** | **Complications (combining both major and minor complications) (%)\*** | | ***P*-value** |
| **NST** |  | **Total n=49,946** | **Treatment** | **Control (without NST)** |  |  | **Treatment** | **Control** |  |
| Schaverien et al., 2013[35] | Prospective s | 87 | 30 (34%)  Adriamycin, cyclophosphamide, doxetaxel, fluorouracil, and epirubicin | 57 (66%) | DIEP (72%), MSTRAM (10%), SIEA (2%), IGAP (15%) | 6 weeks | Total 29 (96%)  Major 9 (30%)  Minor 20 (66.67%) | Total 46 (81%)  Major 14 (24.5%)  Minor 32 (56.14%) | 0.75 |
| Beugels et al., 2019[3] | Retrospective cohort | 326 | 48 (14.72%)  ACTH  Adriamycin, Cyclophosphamide, Taxol, and Herceptin, Adriamycin, Cyclophosphamide, and Taxol , Adriamycin, Cyclophosphamide, and Taxotere | 278 (85.27%) | DIEP (100%) | Immediate | Total 14 (20.9%)  Major 3 (4.5%)  Minor 11 (16.4%) | Total 128 (35.06%)  Major 38 (10.4%)  Minor 90 (24.7%) | 0.14 |
| Hu et al., 2011[21] | Retrospective multivariate | 665 | 180 (27.06%)  doxorubicin/cyclophosphamide (17.8%), doxorubicin/cyclophosphamide/paclitaxel (32.8%), paclitaxel (9.4%), and other (40%) | 485 (72.93) | TRAM (44.8%), tissue expanders (30.4%), LD with implants (10.2%), LD alone (5.3%), immediate implants (5.0%), DIEP (3.9%), and FF (0.6%) | Immediate  and  Delayed | Total 214  (44.12%)  Major 49 (10.10%)  Minor 165 (34.02%) | Total 127 (70.55%)  Major 15 (8.33%)  Minor 112 (62.22%) | 0.90 |
| Cohen et al., 2017 [9] | Retrospective review | 471 | 83 (24.1%)  Adriamycin, cyclophosphamide, paclitaxel, docetaxel, [methotrexate](https://www-sciencedirect-com.ezproxy.csu.edu.au/topics/medicine-and-dentistry/methotrexate), fluorouracil, and doxorubicin. | 127 (26.96%) | immediate TRAM/DIEP/SIEA, direct implant insertion, and immediate tissue expander insertion | ≤ 30 days in  68 (19.7%),  30-60 days in  210 (61.04%),  > 60 days in  66 (19.1%) | Total 113 (32.8%)  From total chemotherapy  Major 36 (10.5%)  Minor 62  (17.9%)  Individual NST %NR | Total 31 (24.4%)  Major 12 (9.4%)  Minor 14 (11%) | 0.07 |
| Teotia et al., 2019[42] | Retrospective review | 128 | 128 (100%)   Adriamycin, Cytoxan, Taxol, carboplatin, Herceptin, and pertuzumab | NR | DIEP 25 (19.5%), LD 1 (0.8%), PAP 5 (3.6%), DIEP plus PAP 1 (8.6%) | ≤8 weeks,  8 to 12 weeks, and >12 weeks | NR | NR |  |
| Decker et al., 2012[13] | Retrospective cohort | 44,533 | 2006 (4.5%)  Regimen = NR | 42527 (95.5%) | Mastectomy with immediate reconstruction 380 (18.9%) | Immediate | Total 246 (12.26%)  Major 116 (5.7%)  Minor 130 (6.48%) | Total 5662 (13.31%)  Major 3012 (7.08%)  Minor 2650 (6.23%) | 0.93 |
| Sutton et al., 2020[41] | Retrospective review | 392 | 392 (100%)  Dose-dense doxorubicin and cyclophosphamide  docetaxel | NR | NR | ≤4 weeks 144(37%)  >4 weeks 248 (63%) | NR | NR |  |
| Kracoff-Sella et al., 2020[22] | Retrospective cohort | 120 | 36 (30%)   Adriamycin, cyclophosphamide, and paclitaxel | 84 (70%) | TBR (51.7%), FF (13.3%) tissue expander (3.3%). Lumpectomy and oncoplastic reconstruction (31.7%) | Immediate | Total 8 (22.22%)  Major 3 (8.33%)  Minor 5 (13.88%) | Total 32 (38.1%)  Major 13 (15.47%)  Minor 19 (22.61%) | 0.44 |
| Zweifel-Schlatter et al., 2010[49] | Prospective | 99 | 47 (47.47%)  Doxorubicin, cyclophosphamide, docetaxel, uorouracil, epirubicin, and cyclophosphamide | 52 (52.52%) | DIEP (56%) TRAM (22%) SGAP (8%) TMG (12%) SIEA (2%) | Immediate | Total 29 (61.7%)  Major 14 (29.78%)  Minor 15 (31.91%) | Total 24 (42%)  Major 10 (17.24%)  Minor 12 (20.69%) | 0.27 |
| Mehrara et al., 2006[29] | Prospective s | 952 | 70 (7.4%)  Regimen = NR | NR | TRAM (81.8%), TFL (5.1%), SGAP (10.1%), DCIA (2.2%) | <6 weeks | Total 266 (27. 9%)  Major 73 (7.7%)  Minor 146 (15.3%) | NR |  |
| Peled et al., 2010[46] | Retrospective review | 163 | 57 (34.9%)  Doxorubicin hydrochloride/cyclophosphamide and paclitaxel | 65 (39.87%) | Expander (54%), PI (15%), PTRA (23%), DIEP (6%) | 4-6 weeks | Total 39 (68.42%)  Major 18 (31.57%)  Minor 21 (36.84%) | Total 16 (25%)  Major 14 (21.53%)  Minor 23 (35.38%) | 0.86 |
| Thiruchelvam et al., 2017[44] | Prospective | 19 | 19 (100%)  Regimen = NR | 0 | DIEP (100%) | <30 days | Total 4 (21.05%)  Major 0  Minor 4 (21.05%) | NR |  |
| Allué-Cabañuz et al., 2019[5] | Retrospective case-control | 171 | 62 (36.25%)  Regimen = NR | 109 (63.74%) | I/E (100%) | Immediate | Total 15 (24.2%)  Major NR  Minor NR | Total 21 (19.3%)  Major NR  Minor NR | 0.44 |
| Moon et al., 2019[30] | Retrospective cohort | 214 | 17 (8%)  Regimen = NR | 197 (92%) | MS-TRAM flaps (100%) | NR | Total 57 (26.63%)  Major 5 (2.33%)  Minor 52 (24.3%) | NR |  |
| Terao et al., 2017[43] | Retrospective cohort | 38 | 20 (52.6%)  Regimen = NR | 18 (47.4%) | (TRAM) flap (39.4%), a pedicled TRAM flap (55.3%), LD flap (5.3%) | NR | Total NR  Minor 6 (30%) | Total NR  Minor 1 (5.5%) |  |
| D’Alessandro et al., 2016[12] | Retrospective case-control | 102 | 33 (32.35%)  Doxorubicin plus cyclophosphamide, docetaxel, paclitaxel, and trastuzumab (H) | 69 (67.65%) | LD flap and silicone implants | 18-134 days | Total 18 (54.54%)  Major 3 (9.09%)  Minor 15 (45.45%) | Total 34 (49.27%)  Major 0  Minor 30 (43.5%) | 0.79 |
| Lee et al., 2016[26] | Retrospective cohort | 1116 | 40 (3.6%)  Regimen = NR | 1076 (96.4%) | Free TRAM or DIEP flaps (12%)  Pedicled TRAM flaps (88%) | 6-7 weeks | Total NR  Major 12 (30%) | Total NR  Major 235 (21.84%) |  |
| Narui et al., 2015[31] | Retrospective case-control | 201 | 38 (18.9%)  Anthracycline and/or taxane | 163 (81.1%) | DIEP, superior and inferior GAP | Immediate | Total 14 (36.84%)  Major 2 (5.26%)  Minor 12 (31.57%) | Total 69 (42.33%)  Major 18 (11.04%)  Minor 51 (31.28%) | 0.75 |
| Lardi et al., 2013[24] | Retrospective cohort | 149 | 21 (14.1%)  Regimen = NR | 128 (85.9%) | Single staged (55%),  Two staged (45%) | 7 weeks | Total 20 (74.07%)  Major 9 (33.33%)  Minor 11 (40.74%) | Total 79 (45.66%)  Major 29 (16.76%)  Minor 50 (28.9%) | 0.26 |
| **AST** |  | **Total n=1427** | **Treatment** | **Control (without AST)** |  |  |  |  |  |
| Hu et al., 2011[21] | Retrospective multivariate | 665 | 485 (72.93)  Doxorubicin/cyclophosphamide (39.8%), Doxorubicin/cyclophosphamide and paclitaxel (41.9%), paclitaxel (1.9%), others (16.5%) | 180 (27.06%) | TRAM (44.8%), tissue expanders (30.4%), LD with implants (10.2%), LD alone (5.3%), immediate implants (5.0%), DIEP (3.9%), and free flaps (0.6%) | Immediate  and  Delayed | NR | NR |  |
| Cohen et al., 2017[9] | Retrospective Review | 471 | 259 (75.3%)  [Adriamycin](https://www-sciencedirect-com.ezproxy.csu.edu.au/topics/medicine-and-dentistry/doxorubicin), [cyclophosphamide](https://www-sciencedirect-com.ezproxy.csu.edu.au/topics/medicine-and-dentistry/cyclophosphamide), [paclitaxel](https://www-sciencedirect-com.ezproxy.csu.edu.au/topics/medicine-and-dentistry/paclitaxel), [docetaxel](https://www-sciencedirect-com.ezproxy.csu.edu.au/topics/medicine-and-dentistry/docetaxel), [methotrexate](https://www-sciencedirect-com.ezproxy.csu.edu.au/topics/medicine-and-dentistry/methotrexate), [fluorouracil](https://www-sciencedirect-com.ezproxy.csu.edu.au/topics/medicine-and-dentistry/fluorouracil), and doxorubicin. | 127 (26.96%) | immediate TRAM/DIEP/SIEA, direct implant insertion, and immediate tissue expander insertion | ≤ 30 days in  68 (19.7%),  30-60 days in  210 (61.04%),  > 60 days in  66 (19.1%) | Total 113 (32.8%)  From total chemotherapy  Major 36 (10.5%)  Minor 62  (17.9%)  Individual AST %NR | Total 31 (24.4%)  Major 12 (9.4%)  Minor 14 (11%) | 0.07 |
| Teotia et al., 2019[42] | Retrospective review | 128 | 50 (39.1)  Herceptin, Navelbine, Halaven, Taxol, Xeloda and Carboplatin | NR | DIEP 25 (19.5%), LD 1 (0.8%), PAP 5 (3.6%), DIEP plus PAP 1 (8.6%) | ≤8 weeks,  8 to 12 weeks, and >12 weeks | NR | NR |  |
| Peled et al., 2010[46] | Retrospective review | 163 | 41 (25.15)  Doxorubicin hydrochloride/cyclophosphamide and paclitaxel | 65 (39.87%) | Expander (54%), PI (15%), PTRA (23%), DIEP (6%) | 4-6 weeks | Total 38  (92. 68%)  Major 13 (31.7%)  Minor 25 (60.97%) | Total 16 (25%)  Major 14 (21.53%)  Minor 23 (35.38%) | 0.87 |

\* Percentage = number patients in the study divided by the total number of patients included in that study. The *P-*value assessed by *t*-test analysis that compared neoadjuvant systemic therapy vs adjuvant systematic therapy.

**DCIA** = deep circumflex iliac artery, **DIEP** = deep inferior epigastric perforators, **FF** = free-flap, **GAP** = gluteal artery perforator, **I/E** = implant/expander, **LD** = latissimus dorsi, **MS-TRAM**= muscle sparing transverse rectus abdominis myocutaneous, **NR** = not reported, **NST** = neoadjuvant systemic therapy, **PAP** = profunda artery perforator, **PI** = permanent breast implant, **PTRA** = pedicle transverse rectus abdominus, , **SGAP** = superior gluteal artery perforator, **SIEA** = superficial inferior epigastric artery, **SGAP** = superior gluteal artery perforator, **TBR** = targeted breast re-innovation, **TMG** =  transverse myocutaneous gracilis, **TRAM** = Transverse rectus abdominis myocutaneous

The total complication rate for post-chemotherapy BRS patients was 46.03% compared to 32.49% in patients without chemotherapy (*P=*0.09).Overall NST Major complications 14.5% (*P*=0.61)*,* overall NST Minor complications 28.8% (*P*=0.97), overall AST Major complications 21.1% (*P*=0.69)*,* overall AST Minor complications 39.4% (*P*=0.59). In comparison, the overall rate of BRS major complications of NST were insignificantly lower than the overall major complications of AST (*P*=0.64)*.* Similarly, the overall rate of minor complications of NST were also insignificantly lower than the overall minor complications of AST (*P*=0.70)*.* When comparing NST versus no NST in BRS, the overall complications rates were insignificantly (*P*=0.44) higher in NST patient group. The major complications were insignificantly (*P*=0.61) higher in NST, similarly with minor complications (*P*=0.97).

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Studies Indicator** | **35** | **3** | **21** | **9** | **42** | **13** | **41** | **22** | **49** | **29** | **46** | **44** | **5** | **30** | **43** | **12** | **26** | **31** | **24** |
| **Random Sequence Generation** | N | N | N | N | N | N | N | N | Y | N | N | N | N | N | N | N | N | N | N |
| **Allocation Concealment** | N | N | N | N | N | N | N | N | Y | N | N | N | N | N | N | N | N | N | N |
| **Complete outcome data** | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| **Selective reporting** | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| **Total points** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

**Table 2.** Quality assessment of studies

**Y** = Yes, **N** = No, Range of points: 0-4(studies scoring 2-3 are considered of good quality and a score of 4 is regarded as an excellent quality study).

**Table 3.** Risk of Bias assessment of RCT studies by use of Cochrane Collaboration’s tool

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **D1** | **D2** | **D3** | **D4** | **D5** | **Overall** |
| Hu et al., 2011[21] |  |  |  |  |  |  |
| Beugels et al., 2019[3] |  |  |  |  |  |  |
| Cohen et al., 2017[9] |  |  |  |  |  |  |
| Allué-Cabañuz et al., 2019[5] |  |  |  |  |  |  |
| D’Alessandro et al., 2016[12] |  |  |  |  |  |  |
| Narui et al., 2015[31] |  |  |  |  |  |  |

Risk of Bias Domains:

D1: Bias arising from the randomization process, D2: Bias due to deviations from the intended intervention, D3: Bias due to missing outcome data, D4: Bias in measurement of the outcome, D5: Bias in the selection of the reported result, Green plus sign: Low risk, yellow question mark sign: Not reported, red minus sign: High risk.

**Table 4.** The Risk of Bias of non-randomized studies in this systematic review by use of ROBINS-I

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Studies indicator** | **35** | **42** | **13** | **41** | **22** | **49** | **29** | **46** | **44** | **30** | **43** | **26** | **24** |
| **Bias due to confounding** | N | N | N | N | N | N | N | N | N | N | N | N | N |
| **Bias in selection of participants into the study** | N | N | N | N | N | N | N | N | N | PN | N | N | N |
| **Bias in classification of interventions** | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| **Bias due to deviations from intended interventions** | N | N | N | N | N | N | N | N | N | PN | N | N | N |
| **Bias due to missing data** | Y | Y | Y | Y | Y | Y | PY | Y | Y | Y | PY | Y | Y |
| **Bias in measurement of outcomes** | N | N | N | N | N | N | N | N | N | N | N | N | N |
| **Bias in selection of the reported result** | N | N | N | N | N | N | N | N | N | N | N | N | N |
| **Overall bias** | Low | Low | Low | Low | Low | Low | Moderate | Low | Low | Moderate | Moderate | Low | Low |

**Y** = Yes, **PY** = Probably yes, **PN** = Probably no, **N** = No

**Table 5.** Breast reconstruction surgery complications with neoadjuvant systemic therapy

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Authors**  **Year** | **Number of Patients (NST/**  **control)** | **Microvascular flap used in surgery** | **Time between NST and reconstruction**  **meana/median (range)** | **Total Complications** | | **I/E Loss** | | **Total Flap Losses** | | **Partial Flap Loss** | | **Skin Necrosisc** | | **Re-operation** | | **Hematoma** | | **Seroma** | | **Fat Necrosis** | | **Wound Complicationsd** | |
| **NST** | **Control** | **NST** | **Control** | **NST** | **Control** | **NST** | **Control** | **NST** | **Control** | **NST** | **Control** | **NST** | **Control** | **NST** | **Control** | **NST** | **Control** | **NST** | **Control** |
| Schaverien et al., 2013[35] | 30/57 | DIEP, MS-TRAM,SIEA, IGAP | 6 weeks | 29/30 | 46/56 | NR | NR | 1/30 | 1/57 | NR | | 8/30 | 13/57 | NR | NR | 2/30 | 3/57 | 2/30 | 2/57 | 5/30 | 6/57 | 10/30 | 18/57 |
| Beugels et al., 2019[3] | 48/278 | DIEP | Immediate | 32/67 | 315/365 | NR | | 0 | 9/365 | 2/67 | 15/365 | 3/67 | 24/365 | 2/67 | 31/365 | 3/67 | 34/365 | 0 | 12/365 | 4/67 | 39/365 | 5/67 | 35/365 |
| Hu et al., 2011[21] | 180/485 | TRAM, tissue expanders, LD with implant, LD alone, immediate implants, DIEP, and free flaps | Immediate in 42  Delayed in 38 | 127/180 | 365/485 | 0 | 3/485 | 2/180 | 1/485 | NR | | 13/180 | 45/485 | NR | NR | 5/180 | 26/485 | 27/180 | 59/485 | NR | | 6/180 | 25/485 |
| Cohen et al., 2017[9] | 83/127 | TRAM/DIEP/SIEA, direct implant insertion, and tissue expander insertion | ≤ 30 days in 68  30-60 days in 210  > 60 days in 66 | NR | NR | NR | | NR | | NR | | NR | NR | NR | NR | NR | NR | NR | NR | NR | | NR | NR |
| Teotia et al., 2019[42] | 128/NR | DIEP 25, LD 1, PAP 5, DIEP plus PAP 1 | ≤8 weeks,  8 to 12 weeks, and >12 weeks | 75 | NR | NR | | NR | | NR | | NR | NR | NR | NR | NR | NR | NR | NR | NR | | NR | NR |
| Decker et al., 2012[13] | 2006/42527 | Mastectomy with Immediate Reconstruction | Immediate | 60/2006 | 1304/42527 | 4/2006 | 23/42527 | 112/2006 | 2989/42527 | NR | | 37/2006 | 851/42527 | NR | NR | NR | NR | 13/2006 | 119/42527 | NR | | 20/2006 | 376/42527 |
| Sutton et al., 2020[41] | 392/NR | NR | <4 week  >4 week | 96/400 | NR | NR | | NR | | NR | | NR | NR | NR | NR | NR | NR | NR | NR | NR | | NR | NR |
| Kracoff-Sella et al., 2020[22] | 36/84 | TBR, free flap tissue expander, Lumpectomy oncoplastic reconstruction | Immediate | 8/36 | 32/84 | 0 | 1/84 | NR | NR | NR | | 3/36 | 5/84 | 0 | 7/84 | 1/36 | 3/84 | 1/36 | 1/84 | 1/36 | 11/84 | 2/36 | 4/84 |
| Zweifel-Schlatter et al., 2010[49] | 47/52 | DIEP, TRAM, SGAP TMG, SIEA | Immediate | 29/49 | 24/58 | NR | | 2/49 | 1/58 | 5/49 | 3/58 | NR | NR | NR | NR | 3/49 | 2/58 | 2/49 | 3/58 | NR | | 3/49 | 5/58 |
| Mehrara et al., 2006[29] | 70/NR | TRAM, TFL, SGAP, DCIA | <6 weeks | 266/953 | NR | NR | | NR | | NR | | NR | NR | NR | NR | NR | NR | NR | NR | NR | | NR | NR |
| Peled et al., 2010[46] | 57/65 | Expander, PI, PTRA, DIEP | 4-6 weeks | 13/57 | 16/65 | NR | | NR | | NR | | NR | NR | NR | NR | NR | NR | NR | NR | NR | | NR | NR |
| Thiruchelvam et al., 2017[44] | 19/NR | DIEP | <30 days | 5/19 | NR | NR | | 0 | NR | 0 | NR | 0 | NR | 2/19 | NR | NR | NR | NR | NR | 1/19 | NR | 1/19 | NR |
| Allué-Cabañuz et al., 2019[5] | 62/109 | I/E | NR | 20/62 | 31/109 | NR | | NR | | NR | | 6/62 | 7/109 | 3/62 | 4/109 | 4/62 | 6/109 | 4/62 | 8/109 | NR | | 3/62 | 6/109 |
| Beugels et al., 2019[3] | 48/278 | FF | 4 weeksb (IQR 3-6 weeks) | NR | | NR | | 0/67 | 9/365 | 2/67 | 15/365 | NR | | 2/67 | 31/365 | 3/67 | 34/365 | 0 | 12/365 | 4/67 | 39/365 | 8/67 | 59/365 |
| Moon et al., 2019[30] | 17/197 | FF | NR | 5/17 | 52/197 | NR | | 0/17 | 0/197 | 0/17 | 5/197 | NR | | NR | | NR | | NR | | NR | | 5/17 | 47/197 |
| Terao et al., 2017[43] | 20/18 | PF, FF | NR | NR | | NR | | 0/20 | 0/18 | 3/20 | 1/18 | NR | | NR | | NR | | NR | | NR | | 3/20 | 0/18 |
| D’Alessandro et al., 2016[12] | 33/69 | PF with I/E | 46.3 daysa ± 26.1  40 daysb (18-134) | 18/33 | 34/69 | NR | | 1/33 | 0/69 | NR | | 3/33 | 6/69 | 3/33 | 0/69 | 2/33 | 0/69 | 11/33 | 23/69 | NR | | 6/33 | 8/69 |
| Lee et al., 2016[26] | 40/1076 | PF, FF | NR | NR | | NR | | NR | | NR | | 12/40 | 235/1076 | NR | | NR | | NR | | NR | | NR | |
| Narui et al., 2015[31] | 38/163 | FF | 3-7 weeks | 14/38 | 69/163 | NR | | 0/38 | 1/163 | NR | | 0/38 | 4/163 | 1/38 | 6/163 | 1/67 | 12/365 | 4/38 | 13/163 | NR | | 6/40 | 22/165 |
| Lardi et al., 2013[24] | 21/128 | I/E | 49 daysa | 12/27 | 53/173 | 6/27 | 19/173 | NR | | NR | | 1/21 | 6/128 | NR | | 2/21 | 8/128 | 2/21 | 19/128 | NR | | 7/21 | 19/128 |

**AST** = adjuvant systemic therapy, **CI** = confidence interval, **DCIA** = deep circumflex iliac artery, **DIEP** = deep inferior epigastric perforators, **FF** = free-flap, **GAP** = gluteal artery perforator, **I/E** = implant/expander, **IGAP** = inferior gluteal artery perforator, **LD** = latissimus dorsi, **MS-TRAM**= muscle sparing transverse rectus abdominis myocutaneous, **NR** = not reported, **NST** = neoadjuvant systemic therapy, **OR** = odds ratio, **PAP** = profunda artery perforator, **PF** = pedicled flap, **PTRA** = pedicle transverse rectus abdominus, **SGAP** = superior gluteal artery perforator, **SIEA** = superficial inferior epigastric artery, **TMG** =  transverse myocutaneous gracilis, **TRAM** = transverse rectus abdominis myocutaneous

a = mean, b = median, c = includes mastectomy skin flap necrosis, skin necrosis, and nipple/NAC necrosis, d = Includes dehiscence, delayed healing, epidermolysis, donor site breakdown, and infection,

†Number of complications divided by the total number of patients included in the studies.

**Table 6.** Breast reconstruction surgery complications with adjuvant systemic therapy

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Authors** | **Number of Patients (AST/** | **Surgery** | **Time between AST and reconstruction** | **Total Complications** | | **I/E Loss** | | **Total Flap Losses** | | **Partial Flap Loss** | | **Skin Necrosisc** | | **Re-operation** | | **Hematoma** | | **Seroma** | | **Fat Necrosis** | | **Wound Complicationsd** | | |
| **Year** | **control)** | **Meana/medianb (range)** | **AST** | **Control** | **AST** | **Control** | **AST** | **Control** | **AST** | **Control** | **AST** | **Control** | **AST** | **Control** | **AST** | **Control** | **AST** | **Control** | **AST** | **Control** | **AST** | **Control** |
| Hu et al.19 2011 | 485/180 | TRAM, tissue expanders, LD with implant, LD alone, immediate implants, DIEP, and free flaps | Immediate in 42 | NR | NR | NR | NR | NR | NR | NR | | NR | NR | NR | NR | NR | NR | NR | NR | NR | | NR | NR |
| Delayed in 38 |
| Cohen et al.25 2017 | 259/127 | TRAM/DIEP/SIEA, direct implant insertion, and tissue expander insertion | ≤ 30 days in 68 | NR | NR | NR | | NR | | NR | | NR | NR | NR | NR | NR | NR | NR | NR | NR | | NR | NR |
| 30-60 days in 210 |
| > 60 days in 66 |
| Teotia et al.29 2019 | 50/NR | DIEP 25, LD 1, PAP 5, DIEP plus PAP 1 | ≤8 weeks, | 75 | NR | NR | | NR | | NR | | NR | NR | NR | NR | NR | NR | NR | NR | NR | | NR | NR |
| 8 to 12 weeks, and >12 weeks |
| Peled et al.33 2010 | 41/65 | Expander, PI, PTRA, DIEP | 4-6 weeks | 18/41 | 16/65 | NR | | NR | | NR | | NR | NR | NR | NR | NR | NR | NR | NR | NR | | NR | NR |

**AST** = adjuvant systemic therapy, **CI** = confidence interval**, DIEP** = deep inferior epigastric perforators,  **GAP** = gluteal artery perforator, **LD** = latissimus dorsi**, NR** = not reported, **NST** = neoadjuvant systemic therapy, **OR** = odds ratio, **PAP** = profunda artery perforator **, PI** = permanent implant, **PTRA** = pedicle transverse rectus abdominus, **SIEA** = superficial inferior epigastric artery, **TRAM =** transverse rectus abdominis myocutaneous

a = mean, b = median, c = includes mastectomy skin flap necrosis, skin necrosis, and nipple/NAC necrosis, d = Includes dehiscence, delayed healing, epidermolysis, donor site breakdown, and infection