|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Study** | **N0 of pts** | **Method of double bypass** | **Method of biliary stenting** | **N0 of pts with AE** | **Type of AE** | | | | | | | | | | | | | | | | | |
| pancreatitis | cholangitis | cholecystitis | bleeding | perforation | wound infection | bile leakage | pneumoperitoneum | stent migration | abdominal pain | pneumonia | RBO | RDO | RBO+RDO | prolonged ileus | need for transfusion | other | death |
| Wongsuwanporn, 1983 | 26 | surgical | - | 9 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 3 |
| Lee, 1984 | 65 | surgical | - | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| Parker, 1985 | 13 | surgical | - | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Ferla, 1987 | 14 | surgical | - | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Kaw, 2003 | 18 | endoscopic | ERCP | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hamade, 2005 | 8 | surgical | - | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Khan, 2005 | 2 | surgical | - | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mortenson, 2005 | 38 | surgical | - | 9 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 6 | 0 |
| Olsen, 2005 | 29 | endoscopic | ERCP | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Tang, 2005 | 35 | surgical | - | 17 |  |  |  |  |  | 6 |  |  |  |  |  |  |  |  |  |  |  |  |
| Ghanem, 2006 | 8 | surgical | - | 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 |
| Lesurtel, 2006 | 83 | surgical | - | 22 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 9 | 0 | 7 | 0 |
| Akinci, 2007 | 9 | endoscopic | PTD | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mutignani, 2007 | 64 | endoscopic | ERCP, PTD | 16 | 1 | 6 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 |
| Mann, 2009 | 102 | surgical | - | 27 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 6 |
| Moon, 2009 | 8 | endoscopic | ERCP | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Iwamuro, 2010 | 7 | endoscopic | EUS-BD | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Katsinelos, 2010 | 39 | endoscopic | NA | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Li, 2011 | 18 | endoscopic | NA | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Price, 2011 | 42 | endoscopic | ERCP, PTD | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ardengh, 2012 | 22 | endoscopic | NA | 3 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ausania, 2012 | 50 | surgical | - | 25 |  |  |  |  |  |  |  |  |  |  | 6 |  | 5 |  |  |  | 23 |  |
| Kanno, 2012 | 21 | endoscopic | ERCP, PTD, EUS-BD | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Khashab, 2012 | 9 | endoscopic | EUS-BD | 3 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Study** | **N0 of pts** | **Method of double bypass** | **Method of biliary stenting** | **N0 of pts with AE** | **Type of AE** | | | | | | | | | | | | | | | | | |
| pancreatitis | cholangitis | cholecystitis | bleeding | perforation | wound infection | bile leakage | pneumoperitoneum | stent migration | abdominal pain | pneumonia | RBO | RDO | RBO+RDO | prolonged ileus | need for transfusion | other | death |
| Kim, 2012 | 24 | endoscopic | ERCP, PTD | 19 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 11 | 3 | 0 | 0 | 0 | 0 | 0 |
| Lyons, 2012 | 60 | surgical | - | 24 | no details | | | | | | | | | | | | | | | | | |
| Malde, 2012 | 48 | surgical | - | 11 | no details | | | | | | | | | | | | | | | | | |
| Maluf-Filho, 2012 | 5 | endoscopic | EUS-BD | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| Pan, 2013 | 10 | endoscopic | ERCP, EUS-BD | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tonozuka, 2013 | 11 | endoscopic | ERCP, EUS-BD | 3 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bartlett, 2014 | 351 | surgical | - | 58 | no details | | | | | | | | | | | | | | | | | |
| Canena, 2014 | 50 | endoscopic | ERCP, PTD | 22 | 2 | 8 |  |  |  |  |  |  |  |  |  | 9 | 3 | 8 |  |  |  |  |
| Hamada, 2014 | 20 | endoscopic | ERCP, EUS-BD | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Khashab, 2014 | 35 | endoscopic | ERCP, PTD, EUS-BD | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kohan, 2014 | 42 | surgical | - | 18 |  |  |  | 5 |  |  | 7 |  |  | 1 | 1 |  |  |  | 2 |  |  |  |
| Lee, 2014 | 45 | endoscopic | PTD | 4 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Yu, 2014 | 17 | endoscopic | ERCP | 4 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| Kofokotsios, 2015 | 11 | surgical | - | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Kubo, 2015 | 44 | endoscopic | ERCP, PTD | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Manta, 2015 | 15 | endoscopic | ERCP, EUS-BD | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 |
| Matsumoto, 2015 | 47 | endoscopic | ERCP, EUS-BD | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sanchez-Ocana, 2015 | 61 | endoscopic | ERCP, EUS-BD | 4 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sano, 2015 | 21 | endoscopic | NA | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Williamson, 2015 | 59 | surgical | - | 48 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fu, 2016 | 22 | endoscopic | PTD | 15 |  |  |  |  |  |  |  |  |  |  |  | 6 | 5 |  |  |  | 1 |  |
|  | 31 | surgical | - | 11 | 0 | 2 | 0 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 |
| Ogura, 2016 | 39 | endoscopic | EUS-BD | 8 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Paik, 2016 | 43 | endoscopic | ERCP, PTD | 8 | no details | | | | | | | | | | | | | | | | | |
| **Study** | **N0 of pts** | **Method of double bypass** | **Method of biliary stenting** | **N0 of pts with AE** | **Type of AE** | | | | | | | | | | | | | | | | | |
| pancreatitis | cholangitis | cholecystitis | bleeding | perforation | wound infection | bile leakage | pneumoperitoneum | stent migration | abdominal pain | pneumonia | RBO | RDO | RBO+RDO | prolonged ileus | need for transfusion | other | death |
| Sato, 2016 | 43 | endoscopic | ERCP, EUS-BD | 8 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Zhao, 2016 | 20 | endoscopic | PTD | 19 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 9 | 1 | 0 | 0 | 0 | 0 | 0 | 5 | 0 |
| Fukushima, 2017 | 15 | endoscopic | NA | 12 | 2 | 6 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Hamada, 2017 | 110 | endoscopic | ERCP, EUS-BD | 15 | 4 | 8 | 1 | 1 |  |  | 1 | 1 | 1 |  |  |  |  |  |  |  |  |  |
| Hori, 2017 | 109 | endoscopic | ERCP, PTD | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kim, 2017 | 58 | endoscopic | ERCP | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Matsumoto, 2017 | 81 | endoscopic | ERCP, EUS-BD | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 10 | 0 | 0 | 0 | 0 | 0 |
| Rai, 2017 | 12 | endoscopic | ERCP, EUS-BD | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Staub, 2018 | 71 | endoscopic | ERCP | 3 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Yamao, 2018 | 39 | endoscopic | ERCP, EUS-BD | 15 | 2 | 9 | 1 |  | 1 |  |  |  | 1 |  |  |  |  |  |  |  | 2 |  |

Table, SDC7. Type of adverse events related to endoscopic double stenting and surgical double bypass

AE – adverse event, ERCP – endoscopic retrograde cholangiopancreatography, EUS-BD – endoscopic ultrasound-guided biliary drainage, PTD – percutaneous transhepatic drainage, NA – not available, RBO – recurrent biliary obstruction, RDO – recurrent duodenal obstruction