A total of 258 patients including 201 males and 57 females underwent laparoscopic TME+ANP between January 2016 and December 2018.

**MRN group (June 2018-December 2018):**
MRN were performed in eligible patients before operation, including 39 males and 14 females (n=53)

**Excluded patients (n=55):**
- abdominoperineal resection (n=7)
- postoperative anastomotic leakage (n=11)
- number of harvested lymph nodes <12 (n=8)
- lateral dissection of pelvic lymph nodes (n=2)
- conversion to open surgery (n=2)
- urogenital dysfunction evaluated by forms (n=25)

**34 males and 12 females**
**Patients included (n=46)**

**non-MRN group (January 2016-March 2018):**
patients were collected and analyzed retrospectively. No MRN were performed, including 162 males and 43 females (n=205)

**Excluded patients (n=7):**
- abdominoperineal resection (n=3)
- postoperative anastomotic leakage (n=2)
- number of harvested lymph nodes <12 (n=2)

**120 males and 30 females**
**Patients included (n=150)**

**Figure S1** The enrollment of MRN group and non-MRN group. MRN, magnetic resonance neuroimaging.