Low tie or high tie of IMA as regard anatomic considerations in rectal cancer surgery

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- Consensus does not exist on the level of arterial ligation in rectal cancer surgery.

- From oncologic considerations, the IMA can be ligated at its origin (High tie) or below the origin of left colic artery (Low tie) .

Oncological Considerations

Overview of included studies concerning oncologic considerations of the level of arterial ligation

Study	Level of evidence	Design	N	Tumor location	Procedure	Outcome measure	Results
Uehara *et al.* (2007)[20]	2b	Retrospective cohort	285	Rectum	High or low tie	Five-year survival; incidence of LN+	No significant difference;1.9%
Kanemitsu *et al.* (2006)[24]	2b	Retrospective cohort	1,188	Colon and rectum	High tie	Incidence of LN+	1.7%
Kawamura *et al.* (2005)[25]	2b	Retrospective cohort	121	Rectosigmoid	High tie	Incidence of LN+	0.0% (only pT1 tumors)
Fazio *et al.* (2004)[19]	2b	Retrospective cohort	458	Rectum	High or low tie	Survival	No significant difference
Steup *et al.* (2002)[27]	2b	Retrospective cohort	605	Rectum	High tie	Incidence of LN+	0.3%
Kawamura *et al.* (2000)[13]	2b	Retrospective cohort	511	Colon and rectum	High or low tie	Disease-free survival	No significant differencee
Hida *et al.* (1998)[23]	2b	Retrospective cohort	198	Rectum	High tie	Incidence of LN+	8.6%
Adachi *et al.* (1998)[21]	2b	Retrospective cohort	172	Rectosigmoid	High tie	Incidence of LN+	0.7%
Leggeri *et al.* (1994)[26]	2b	Retrospective cohort	252	Rectum	High tie	Incidence of LN+	4.0%
Corder *et al.* (1992)[18]	2b	Retrospective cohort	143	Rectum	High or low tie	Survival; recurrence	No significant differences
Dworak *et al.* (1991)[22]	2b	Retrospective cohort	424	Rectum	High tie	Incidence of LN+	1.0%
Surtees *et al.* (1990)[16]	2b	Retrospective cohort	250	Rectum	High or low tie	Survival rate	No significant difference
Pezim and Nicholls (1984)[14]	2b	Retrospective cohort	1,370	Rectosigmoid	High or low tie	Five-year survival	No significant difference

Technical Considerations

- Consensus exists on the necessity of well-perfused anastomotic limbs. However, factors jeopardizing anastomotic circulation are not well known.
- The low tie technique allows for adequate blood supply to the colon proximally to the anastomosis.
- In high tie, the vascularization of the distal colon and sigmoid depends completely on the middle colic and marginal arteries.

- In many patients a decrease in systemic blood pressure occurs during the recovery phase, in some cases pressure in the marginal artery is insufficient to maintain adequate blood flow .

-In older patients with atherosclerotic vessels, ligation of IMA (high tie) might result in hypoperfusion of the proximal limb.

-In some patients deficits of marginal artery might exist at the splenic flexure.

- Apart from ischemia, tension on the anastomosis is thought to increase the risk of anastomotic leakage.
- Some authors state that high tie often is indispensable to guarantee a tension-free anastomosis in low anterior resection. With this technique the proximal limb is not withheld by an intact LCA-IMA-aorta axis.
- However, a tension-free anastomosis also can be achieved in low tie resections by cutting the descending branch of LCA.

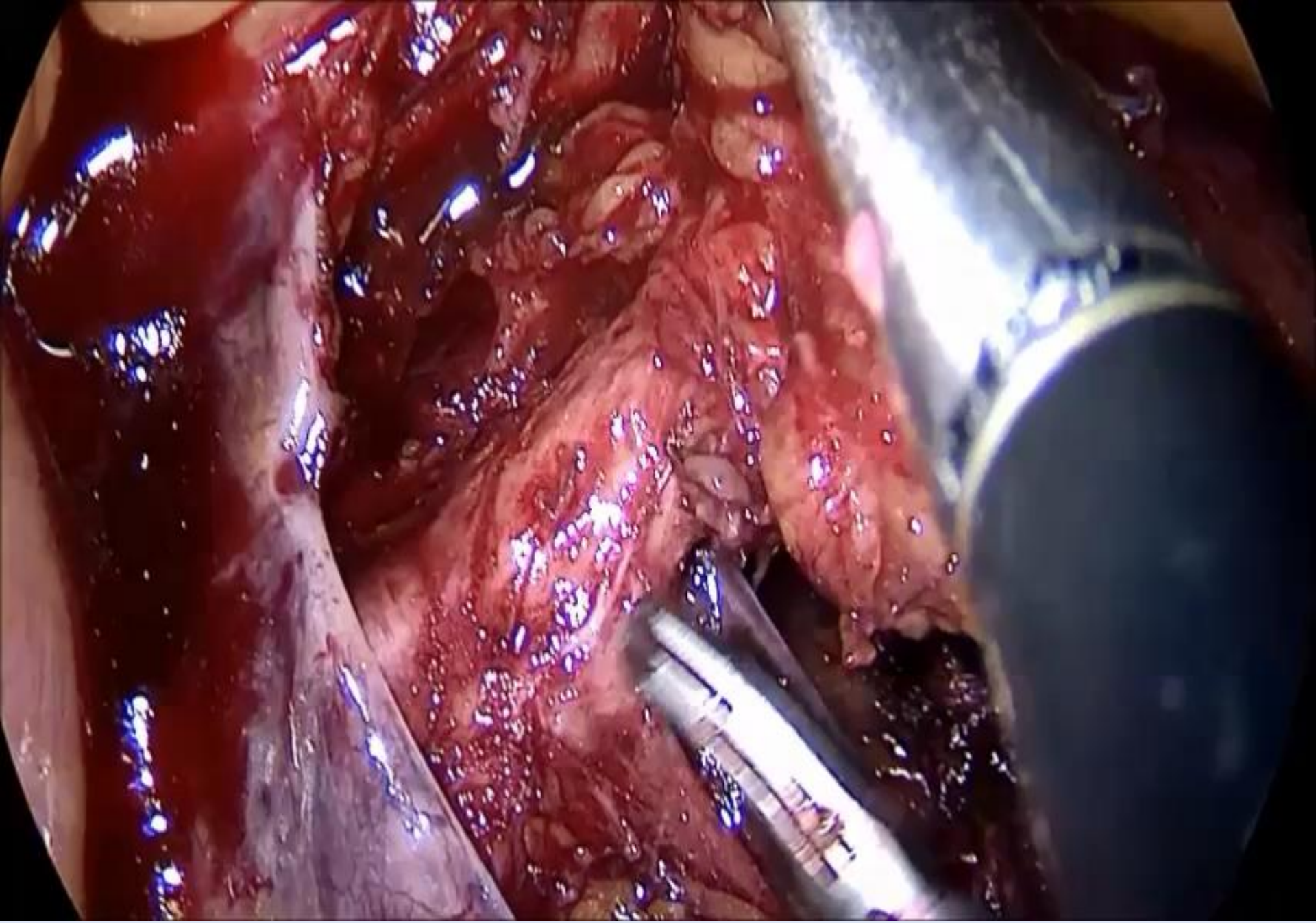
Overview of studies concerning the influence of the level of arterial ligation on anastomotic circulation

Study	*Level of evidence*	*Design*	*N*	*Procedure*	*Outcome measure*	*Results*
Seike *et al.* (2007)[31]	2b	Prospective cohort	96	Rectal cancer resection with high tie	Tissue blood flow	Significant blood flow reduction after high techniques; high blood flow reduction in older, male patients
Dworkin *et al.* (1996)[29]	2b	Prospective cohort	26	Rectosigmoid resection	Tissue blood flow	Significant blood flow reduction after IMA ligation
Hall *et al.* (1995)[28]	2b	Prospective cohort	62	Colorectal resection with high or low tie	Tissue oxygen tension	No significant difference; tissue oxygen tension of sigmoid not adequate after both techniques
Kashiwagi *et al.* (1994)[30]	2b	Prospective cohort	13	IMA clamping	Tissue blood flow	No significant reduction
Corder *et al.* (1992)[18]	2b	Retrospective cohort	143	Rectal resection with high or low tie	Anastomotic leakage rate	No significant differences

Until now the benefit of low tie concerning perfusion of the anastomosis has not been proven .

- **The aim of the present study is to determine the feasibility and benefit concerning perfusion of laparoscopic low tie of IMA in colorectal surgery**

- We will review retrospective data of thirteen cases of colorectal cancer underwent laparoscopic low anterior resection in Assiut university hospital.
- In all cases we performed laparoscopic low tie of IMA.
- Procedures were performed according to the principle of total mesorectal excision.
- Patient demographics, perioperative variables, oncological and short term outcomes, morbidity and mortality has been assessed.
- One case developed anastomotic leak.



Conclusion

-Until now the level of arterial ligation has been debated. The lack of prospective, randomized, clinical trials with inconsistent methodology can be held responsible for this lack of consensus.

- Further accumulation of cases are needed to determine benefit concerning perfusion of laparoscopic low tie IMA in colorectal surgery


Thank You!