

Mide kanserinde minimal invaziv cerrahi: Onkolojik değerlendirme ve gelecek

Oturum: PANEL-29: ÜST GIS

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Herhangi bir biyomedikal firma ile sunumun içeriği ile ilgili bilimsel/etik ihlal oluşturacak çıkar çatışmam bulunmamaktadır.

Medtronic - Kurs eğitimi honorarium (>3 yıl)
Bard - Kurs eğitimi honorarium (>3 yıl)
Eczacıbaşı - Konuşmacı honorarium (>3 yıl)
Nutricia - Konuşmacı (>3 yıl)
Fresenius - Konuşmacı honorarium

Mide Kanserinde Minimal Invaziv Cerrahi

| | |
|-------------|-------|
| EGC | AGC |
| Distal | Total |
| Laparoskopi | Robot |

EGC Distal Laparoskopi

KLASS01 2006-2010
Non-inferiority
5y-OS

5y-OS
94.2% LDG grup
93.3% ODG grup

similar overall and cancer-specific survival rates between patients receiving laparoscopic and open distal gastrectomy

Kim HR et al. JAMA Oncology 2019

EGC Distal Laparoskopi

JCOG0912 2010-2013
Non-inferiority
relapse-free survival

5y-RFS
95.1% LDG grup
94% ODG grup

non-inferiority of LDG compared with ODG for clinical stage I gastric cancer relapse-free survival, suggesting that LDG should be considered a standard treatment option when performed by experienced surgeons.

Kital H et al. Lancet Gastro Hepat 2019

AGC Distal Laparoskopi

KLASS02 2011-2015
Non-inferiority
3y relapse-free survival

3y-RFS
80.3% LDG grup
81.3% ODG grup

Laparoscopic distal gastrectomy with D2 lymphadenectomy was comparable to open surgery in terms of relapse-free survival for patients with locally advanced gastric cancer.

Hyung WJ et al. J Clin Oncol 2020

AGC Distal Laparoscopi

KLASS02-QC

Surgeons recruitment

- > 10 laparoscopic and open gastroscopies (surgeon experience)
- > 50 gastroscopies / year (hospital volume)
- Approved by institutional review board

Video submission

- Three laparoscopic and 3 open assisted gastrectomy videos
- Within 6 months after approval by institutional review board

Video assessment

- Each video peer reviewed by 3 experts
- Based on video evaluation criteria
- Within 1 month after submission

Decision qualification

- By review evaluation committee
- Based on assessment results and videos
- At every 3 sequential surgeons video assessment completion

Qualified

Enroll patients for KLASS02-RCT

40 surgeons applied

2 withdrawal

38 surgeons approved by institutional review board

11 surgeons Disqualified

- 2 did not meet surgeon eligibility
- 9 failed to submit videos

27 surgeons submitted videos

12 surgeons Qualified

15 surgeons Not-qualified (requested to resubmit videos)

8 surgeons Qualified

3 surgeons Not-qualified (requested to resubmit videos)

4 surgeons Disqualified

- 1 poor surgical proficiency
- 1 failed to resubmit videos

1 surgeon Qualified

2 surgeons Disqualified

Han SU et al. Ann Surg 2021

AGC Distal Laparoscopi

JLSSG0901

2010-2015

Non-inferiority

Relapse-free survival

| | Progress |
|------------------------------|---------------------------|
| Recruitment status | No longer recruiting |
| Date of protocol fixation | 2009 Year 09 Month 15 Day |
| Date of IRB | |
| Anticipated trial start date | 2009 Year 11 Month 01 Day |
| Last follow-up date | 2021 Year 08 Month 01 Day |

Krahn H et al. World J Surg 2015

AGC Distal Laparoscopi

CLASS01

2012-2014

Non-inferiority

3y Disease-free survival

3y laparoscopic distal gastrectomy, compared with open distal gastrectomy, did not result in inferior disease-free survival at 3 years.

3y laparoscopic distal gastrectomy with D2 lymphadenectomy performed by experienced surgeons in high-volume specialized institutions resulted in similar 5-year overall survival

3y-DFS

76.5% LDG group

77.8% ODG group

Yu J et al. JAMA 2019

Huang C et al. JAMA Surg 2021

EGC Total Laparoscopi

KLASS03

JCOG1401

Morbidity 20.6% (33/160)

Mortality 0.6% (1/160)

Major complications 9.4% (15/160)

Reoperations 1.9% (3/160)

LTG performed by experienced surgeons showed acceptable postoperative morbidity and mortality for patients with clinical stage I gastric cancer.

EJ Anastomosis leakage 2.5% (6/244)

Conversion 1.7%

Mortality 0

confirmed the safety of LATG/LAPG

Hyung WJ et al. Gastric Cancer 2018

Katai H et al. Gastric Cancer 2019

EGC Total Laparoscopi

CLASS02 (RCT)

2017-2018

Non-inferiority

Early operative morbidity and mortality rate

The results of the CLASS02 trial showed that the safety of LTG with lymphadenectomy by experienced surgeons for clinical stage I.

Rate difference, Laparoscopic vs open total gastrectomy (95% CI, P, I², N, H, I², P, I²)

Liu F et al. JAMA Oncology 2020

AGC Total Laparoscopi

KLASS06

Multi-center, Prospective, Phase III trial

Primary endpoint: 3 year relapse free survival

Estimated sample size: 772 patients

~772 hasta

Tarih: 2018-2027

3 year follow-up

1 Surgeon Qualified / Year

2 Surgeon Qualified / Year

Laparoskopi

LOGICA

2015-2018
Open vs. Lap
Hospital stay

Median hospital stay: 7 days (IQR 5-9, $P = .34$). No difference

Median blood loss was less in the laparoscopic group (150 v 300 mL, $P < .001$). ✓

Mean operating time was longer in the laparoscopic group (216 v 182 minutes, $P < .001$). ✗

Postoperative complications (44% v 42%, $P = .91$). No difference

In-hospital mortality (4% v 7%, $P = .40$). No difference

30-day readmission rate (9.6% v 9.1%, $P = 1.00$). No difference

R0 resection rate (95% v 95%, $P = 1.00$). No difference

Median lymph node yield (29 v 29 nodes, $P = .49$). No difference

1-year overall survival (76% v 78%, $P = .74$). No difference

Global health-related quality of life up to 1 year postoperatively. No difference

Laparoscopic gastrectomy **did not lead to a shorter hospital stay** in this Western multicenter randomized trial of patients with predominantly advanced gastric cancer. Postoperative complications and oncological efficacy did not differ between laparoscopic gastrectomy and open gastrectomy.

Van der Vaen et al. J Clin Oncol 2021

Robotik

| Study or Subgroup | Events | Total | Events | Total | M-H, Random, 95% CI |
|--|--------|-------|--------|-------|---------------------|
| Chang 2016 | 10 | 20 | 11 | 20 | 1.03 [0.51, 1.65] |
| Chang 2016 | 8 | 20 | 8 | 20 | 1.03 [0.51, 1.65] |
| Kim 2017 | 4 | 30 | 4 | 30 | 2.03 [0.82, 4.92] |
| Kim 2017 | 22 | 60 | 18 | 60 | 0.89 [0.67, 1.18] |
| Kim 2017 | 13 | 25 | 15 | 25 | 0.89 [0.67, 1.18] |
| Kim 2017 | 37 | 421 | 374 | 483 | 0.78 [0.69, 0.88] |
| Kim 2017 | 30 | 351 | 31 | 351 | 0.85 [0.69, 1.02] |
| Kim 2018 | 9 | 72 | 9 | 72 | 1.03 [0.64, 1.66] |
| Kim 2018 | 19 | 108 | 22 | 102 | 1.03 [0.64, 1.66] |
| Kim 2018 | 7 | 107 | 10 | 108 | 1.03 [0.64, 1.66] |
| Kim 2018 | 14 | 100 | 28 | 282 | 1.42 [0.72, 2.80] |
| Kim 2018 | 3 | 127 | 40 | 481 | 1.03 [0.64, 1.66] |
| Kim 2018 | 22 | 160 | 18 | 168 | 1.03 [0.64, 1.66] |
| Kim 2018 | 44 | 436 | 35 | 381 | 0.78 [0.71, 0.86] |
| Kim 2018 | 0 | 16 | 1 | 11 | 0.20 [0.01, 0.71] |
| Kim 2019 | 5 | 87 | 28 | 286 | 0.81 [0.51, 1.19] |
| Kim 2019 | 41 | 284 | 161 | 359 | 0.89 [0.82, 0.97] |
| Kim 2019 | 15 | 113 | 13 | 112 | 1.03 [0.64, 1.66] |
| Kim 2019 | 6 | 100 | 8 | 100 | 0.89 [0.67, 1.18] |
| Kim 2019 | 14 | 161 | 38 | 203 | 1.03 [0.64, 1.66] |
| Kim 2019 | 2 | 34 | 38 | 437 | 0.78 [0.69, 0.88] |
| Kim 2019 | 2 | 34 | 38 | 437 | 0.78 [0.69, 0.88] |
| Kim 2019 | 48 | 275 | 52 | 322 | 0.82 [0.68, 0.97] |
| Kim 2019 | 50 | 301 | 14 | 101 | 0.89 [0.67, 1.18] |
| Kim 2019 | 12 | 146 | 48 | 612 | 1.11 [0.72, 1.70] |
| Kim 2019 | 36 | 14 | 48 | 146 | 0.89 [0.67, 1.18] |
| Kim 2019 | 9 | 31 | 31 | 390 | 0.89 [0.67, 1.18] |
| Kim 2019 | 2 | 1 | 48 | 146 | 0.89 [0.67, 1.18] |
| Kim 2019 | 1 | 26 | 17 | 20 | 0.78 [0.69, 0.88] |
| Kim 2019 | 2 | 25 | 38 | 225 | 0.81 [0.51, 1.19] |
| Kim 2019 | 82 | 222 | 22 | 222 | 0.82 [0.68, 0.97] |
| Kim 2019 | 28 | 220 | 38 | 220 | 0.81 [0.51, 1.19] |
| Kim 2019 | 9 | 172 | 63 | 91 | 1.28 [0.94, 1.74] |
| Kim 2019 | 6 | 26 | 16 | 85 | 0.78 [0.69, 0.88] |
| Subtotal, I ² , 96.0% | | | | | 0.81 [0.74, 0.88] |
| Test for heterogeneity: Tau ² = 0.24, I ² = 96.0%, H ₀ : Tau ² = 0, P < .001, P < .001 | | | | | |

Fig. 3-8. Overall complications

higher **operating time** [MD 44.73, (95%CI 36.01, 53.45) p < 0.00001]
 less **intraoperative blood loss** [MD -18.24, (95%CI -25.21, 11.26) p < 0.00001]
 lower rate of **major surgical complication** [OR 0.66, (95%CI 0.49, 0.88) p = 0.005]
 increased number of **retrieved lymph nodes** [MD 1.84, (95%CI 0.84, 2.84) p = 0.0003]

Guerrini GP et al. US 2020

Robotik

2018-2020
Lap vs. Robotik - RCT
intra-abdominal infectious complications

No significant difference in the incidence of intra-abdominal infectious complications (per-protocol)
(10 of 117 [8.5%] in the LG group vs 7 of 113 [6.2%] in the RG group)

grade II or higher was significantly higher in the LG group (23 [19.7%]) than in the RG group (10 [8.8%]) (P = .02)

grade IIIa or higher significantly higher in the LG group (19 [16.2%]) than in the RG group (6 [5.3%]) (P = .01)

Ogino T et al. JAMA Surg 2021

EGC

AGC

Distal Total

!!! Experienced...
!!! High-volume...

Minimally Invasive Surgery for Gastric Cancer

Minimally Invasive Surgery of Gastric Cancer
Guner, Ali (et al.)

Minimally Invasive Surgery for Upper Abdominal Cancer

Mide Kanseri ve Cerrahi Tedavisi

Mide Kanserinde Laparoskopik ve Robotik Cerrahi

is not INFERIOR

Gelecek?

A Procedure to define fluorescent LNs

| | | | |
|---|---|---|---|
| ICG Injection Endoscope submucosal injection of ICG at 1.5 before surgery | Robotic Gastrectomy With ICG Lymphography Surgeons switched on NIR mode intermittently during surgery | LN Retrieval LNs are picked up under NIR visualization after division by each station | Reevaluation of Specimen LNs in paraffin blocks are rechecked using NIR image to confirm status on examination by pathologist |
|---|---|---|---|

B Fluorescent stations

Fluorescent station
Fluorescent LN
Nonfluorescent LN
Nonfluorescent station

Kim IG et al. JAMA Surg 2019

Gelecek?

A

B

Rohi CK et al. Sci Rep 2020

Gelecek?

Kim YM et al. J Gastr Surg 2012

Gelecek?

Future

Personalized Surgery empowered by AI and big data

Reshaping Surgery Through Digital Innovation

hutum.io

Gelecek?

Pre-op **Intra-op** **Post-op**

Better Surgery Preparation

- Personalized Surgical Planning
- Personal 3D Anatomy Map
 - CT/MRI/2D Images
 - Virtual Anatomy Modeling
- Pneumoperitoneum Modeling
- Port Placement Planning

Real-Time Surgeon Assist

- Surgical Realtime Navigation
 - Providing the Same View as the Actual Operation
 - Synchronized Camera Movement
 - VR Technology
- Surgical Video Hub
 - 4K 3D Stereoscopic Video Recording
 - AI-Enhanced Imaging Recognition

Surgery Analysis and Review

- Surgical Video Data Analysis
 - Event Recognition
 - Object Detection
 - Data Annotation

Product Features

- 4K 3D Stereoscopic Video Recording
- The Largest System Storage
- AI Editing
- 10.1" Full Touch Display Panel
- Data Transfer Through FTP and NAS

VIRUS
The 1st AI-empowered Surgical Video Hub

hutum.io

Gelecek?

Pre-op **Intra-op** **Post-op**

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Product Feature

- 2D CT Image to 3D Anatomy Reconstruction
- Pneumoperitoneum Modeling
- Port Placement Planning
 - Endoscope & Instrument Location
 - Port Distance Measurement
- Various Points of View
 - Endoscope View
 - Focus View
 - Explore View
- Bookmarking
- Snapshot

RUS
The 1st Surgical Navigation Platform for General Surgery

hutum.io

Gelecek?

Pre-op

Better Surgery Preparation

Personalized Surgical Planning

- Personal 3D Anatomy Map
- CT/MRI 2D Images
- Virtual Anatomy Modeling

Pneumoperitoneum Modeling

Port Placement Planning

Intra-op

Real-Time Surgeon Assist

Surgical Realtime Navigation

- Providing the Same View as the Actual Operation
- Synchronized Camera Movement
- VR Technology

Surgical Video Hub


- 4K 3D Stereoscopic Video Recording
- AI-Compressed Imaging Recognition

Post-op

Surgery Analysis and Review

Surgical Video Data Analysis

- Event Recognition
- Class Detection
- Data Annotation



- Surgical Phase Recognition
- Event Detection
- Surgical Bleeding
- Non-Surgical Events
- Instrument Movement Analysis
- Surgical Reporting

SurgGram
Intelligent Platform for Surgical Video Analysis & Review

hubtm.io

Gelecek?

CLASS 05

ClinicalPath.com Identifier: NCT02828242

FULL NAME | Multicenter prospective randomized controlled trial of laparoscopic en bloc gastrectomy and ileocolic resection with gastrojejunostomy for adenocarcinoma of the gastric antrum

CLASS 07

ClinicalPath.com Identifier: NCT02828242

FULL NAME | A multicenter randomized controlled trial comparing the quality of life between laparoscopic assisted total gastrectomy and total laparoscopic total gastrectomy for gastric cancer

Laparoscopic D2 Distal Gastrectomy Following Neoadjuvant Chemotherapy for Locally Advanced Gastric Cancers (CLASS-03a)

Multicenter Study on Laparoscopic Total Gastrectomy for Advanced Gastric Cancer (CLASS-07)

Indocyanine Green Tracer Using in Laparoscopic Radical Gastrectomy for Locally Advanced Gastric Cancer (CLASS-11)