A pilot study to assess the safety and feasibility of fluorescent sentinel lymph node identification in colon carcinoma using Indocyanine green.

No registrations found.

Ethical review	Positive opinion
Status	Recruiting
Health condition type	-
Study type	Interventional

Summary

ID

NL-OMON24349

Source
Nationaal Trial Register

Brief title
FLUOR-SLN-ICG

Health condition

cT1-T2 colon carcinoma

Sponsors and support

Primary sponsor: Meander Medical Centre, Department of Surgery
Source(s) of monetary or material Support: 't Stichts Genootschap, EAES

Intervention

Outcome measures

Primary outcome

1. Identification rate of SLN with ICG: Number of patients with one or more SLNs identified /

total number of procedures (n, %).
2. Adverse events related towards ICG: Number of adverse events related towards ICG / total number of procedures (n, %).

Secondary outcome

3. False negative SLNs: The SLNs are negative whereas the non-sentinel nodes (NSNs) were positive (number).
4. True negative SLNs: Both the SLNs and NSNs are negative (number).
5. Sensitivity: The number of patients with a positive SLN / the total number of node positive patients (n, %).
6. Upstaging: The number of patients with SLNs positive for micro- or macrometastases by serial slicing and IHC / the number of patients who were node negative by H&E examination (n, %).
7. Aberrant lymph node status: The number of patients with aberrant lymph nodes, and the status of these lymph nodes considering micro- or macrometastases.
8. Accuracy: (The total number of patients with a positive SLN + the number of patients with a truenegative SLN) / number of patients with an identified SLN (n, %).

Study description

Background summary

The current gold standard for the treatment of colon carcinoma consists of the surgical enbloc resection of the colonic segment including the adjacent mesocolon containing the draining lymph nodes. Analysis of these lymph nodes is important, since lymph node status is one of the most important prognostic factors determining the use of adjuvant chemotherapy. Although patients with tumour stage I and" do not have lymph node metastases, 15-20% develop recurrent disease. Several studies suggest that ultrastaging techniques such as immunohistochemistry (IHC) or reverse transcriptase polymerase chain reaction (RT-PCR) using multilevel slicing results in upstaging of 14-18% of patients, due to newly found (micro)metastasis. Furthermore, several studies indicate that these micrometastases are correlated with a significantly poorer prognosis, subsequently suggesting that this subgroup of patients might benefit of adjuvant chemotherapy. Therefore, the most recent Dutch guidelines advice the use of adjuvant chemotherapy in this "upstaged" group, although evidence is still lacking.

However, ultrastaging techniques are labour-intensive and costly, and therefore not suitable for analyses of all lymph nodes that have been collected during segmental colectomy. Sentinel lymph node (SLN) identification in colon carcinoma has been proposed to overcome this problem by identifying the first order draining lymph node(s) of the tumour, which have the highest chance of containing metastatic tumour cells. Several studies aimed at SLN identification in colon carcinoma have been published, however, early studies using radioguided or blue-dye guided SLN identification, showed relatively high rates of false

negatives with consequent low sensitivity rates. Since mesocolon is rather fatty tissue, visualization of conventional dyes is difficult. Indocyanine green (ICG), which can be visualized using near infrared (NIR), has been put forward since it is known to penetrate relatively deep into living tissue.

Nevertheless, results of SLN identification using ICG remain unsatisfying with high false negative rates and low sensitivity. Most likely this is due to the fact that these studies also included large cT3-cT 4 tumours and patients with massive lymph node involvement. Which are factors known to interfere with lymph drainage patterns. Furthermore, subserosal injections were frequently used, while it is suggested that submucosal injections might result in better sensitivity of the procedure. Therefore this prospective study aims to assess the safety and feasibility of lymph node identification using ICG in patients with cT1-cT2 tumours, without gross lymph node involvement, using peritumoral submucosal injections.

Study objective

The sentinel lymph node procedure for cT1-T2 colon carinoma is a safe and feasible procedure.

Study design

Outcome 1, 3, 4, 5, 8 are measured after pathological ultrastaging.
Outcome 2 is measured from start of ICG injection (intervention) until 30 days after surgery.
Outcome 7 is determined during surgery: presence of aberrant lymph node yes/no. And the presence of metastases in aberrant lymph nodes is determined after pathological ultrastaging.

Intervention

Patients will then undergo robot-assisted surgery, they will be prepped, draped and placed under general anesthesia. Robot-assisted access will be obtained in the traditional fashion and abdominal exploration shall be performed to rule out intra-abdominal metastasis. The involved segment is mobilized carefully without disruption of the lymphatic channels and blood vessels. During segmental robot-assisted colectomy a colonoscopy will be performed by the gastroenterologist on the operation room. A bowel clamp will be placed over the distal ileum, and C02 will be used by the gastroenterologist to prevent massive intestinal distension. The colonoscopy will be done while intra-abdominal access is achieved by the surgeon with the Da Vinci. The gastroenterologist will administer two to four blebs of IGG peritumoral and submucosal. The SLN will be visualized using NIR light with the Firefly modus of the Da Vinci Xi (Intuitive Surgical Inc., Sunnyvale, USA), a suture will be placed to mark the observed SLN(s). In case there is an aberrant sentinel node (outside the planned resection margins) this sentinel node will be harvested. After mobilization is completed the involved segment of the colon and the regional lymph nodes will be resected in a conventional manner. After extraction of the specimen (segmental colectomy including regional lymph nodes), ex-vivo examination of the specimen using the Firefly camera will be done to visualize the location of the SLN(s). The entire specimen and all biopsies will be submitted for

pathologic examination. Postoperative management for patients will be according to standard of care.

Contacts

Public
Meander Medisch Centrum
Daan Sikkenk

0338501268
Scientific
Meander Medisch Centrum
Daan Sikkenk

0338501268

Eligibility criteria

Inclusion criteria

- Oral and written informed consent (IC);
- Aged 18 years and older;
- Pathologically confirmed and/or suspected T1-T2 colon carcinoma without (suspected) lymph node metastases.

Exclusion criteria

- Distant metastasis;
- cT3- T 4 disease based on pre-operative assessment;
- Metastatic or T 4 disease discovered during intraoperative staging;
- A tumour too large to pass endoscopically;
- Pregnancy, lactation or a planned pregnancy during the course of the study.
- Known allergy to any of the compound used for SLN identification (ICG, iodine or sodium iodide);
- Suspected or proven lymph node metastasis;
- Previous colon surgery;
- Contra-indication for robotic surgery;
- Ink marking close to the tumour;
- Severe kidney- or liver failure;

- Hyperthyroidism or an autonomously functioning thyroid adenoma.

Study design

Design

Study type:	Interventional
Intervention model:	Other
Allocation:	Non controlled trial
Masking:	Open (masking not used)
Control:	N/A , unknown

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	13-09-2020
Enrollment:	10
Type:	Anticipated

IPD sharing statement

Plan to share IPD: Undecided

Ethics review

Positive opinion

Date:	13-09-2020
Application type:	First submission

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
NTR-new	NL8901
Other	MEC-U : R19.056

Study results