

Cancer Association of South Africa (CANSA)

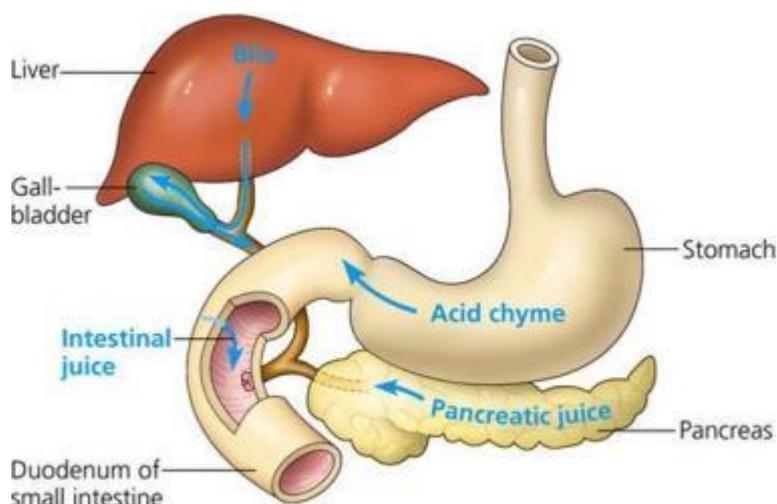


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Fact Sheet on Duodenal Cancer

Introduction

The duodenum is the first part of the small intestine. The other parts are the jejunum and the ileum. Digestion of food, which commences in the stomach, continues in the duodenum once the chyme enters the duodenum from the stomach. The stomach acid is neutralised in the duodenum because of the alkaline environment inside the duodenum. The entry of chyme triggers the release of digestive pancreatic enzymes and bile which enter the duodenum via the pancreatic and common bile ducts, respectively. These 2 ducts join the duodenum at the ampulla of Vater, or the hepatopancreatic ampulla.



Picture Credit: Duodenum

The pancreatic juice contains enzymes and bicarbonate to neutralise the stomach acid. The pancreatic enzymes are lipase (breaks down fats), protease (breaks down protein) and amylase (breaks down carbohydrates). Bile is a dark green or brownish coloured fluid produced by the liver. Bile is passed to the gallbladder and then into the duodenum to help with the digestion of fat.

The chyme is gradually pushed down the duodenum by peristaltic waves which flow down the length of the digestive tract. Most of the digestion of the protein, fats and carbohydrate in the chyme is done by the enzymes in the duodenum, before the resultant mixture is passed further into the small intestine.

Duodenal Cancer

Duodenal cancer develops in the small intestine, which is part of the digestive system and connects the stomach to the colon.

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Page 1

The small intestine, or small bowel, is a long, folded tube that sits in the lower abdomen. It consists of three parts: the duodenum, the jejunum, and the ileum.

Duodenal cancer starts in the duodenum, which is the uppermost portion of the small intestine. There are four main types of small intestine cancer:

Adenocarcinoma initially develops in the glandular cells that line the inside of the small intestine. Adenocarcinomas are the most common type of small intestine cancer, accounting for approximately
Sarcoma begins in the muscle and other supporting tissues of the small intestine. Around 10% of small intestine cancers are sarcomas

Carcinoid tumours are slow-growing and develop in the neuroendocrine cells of the small intestine. Neuroendocrine cells produce hormone-like substances

Lymphomas form in cells called lymphocytes. These are part of the immune system and are present in most parts of the body, including the intestines

Gastrointestinal stromal tumour

Small intestine cancers are rare and is more common in older people, particularly in those aged over 60 years.

Incidence of Duodenal Cancer in South Africa

The National Cancer Registry (2014) does not provide any information regarding Duodenal Cancer. All Cancers of the Small Intestine are grouped together and listed under 'Small Intestine'.

According to the National Cancer Registry (2014) the following number of cases of cancer of the Small Intestine was histologically diagnosed during 2014. Histologically diagnosed means that a tissue sample was forwarded to a pathology laboratory where a specially trained pathologist confirmed a cancer diagnosis after viewing the tissue sample under a microscope.

Group - Males 2014	Actual No of Cases	Estimated Lifetime Risk	Percentage of All Cancers
All males	86	1:1 812	2,23%
Asian males	5	1:985	0,56%
Black males	37	1:2 839	0,34%
Coloured males	15	1:971	3,34%
White males	29	1:1 095	0,14%

Group - Females 2014	Actual No of Cases	Estimated Lifetime Risk	Percentage of All Cancers
All females	62	1:3 975	0,16%
Asian females	4	1:3 623	0,34%
Black females	30	1:5 475	0,19%
Coloured females	8	1:2 987	1,20%
White females	19	1:2 175	0,12%

The frequency of histologically diagnosed cases of cancer of the Small Intestine in South Africa for 2014 was as follows (National Cancer Registry, 2014):

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Group - Males 2014	0 – 19 Years	20 – 29 Years	30 – 39 Years	40 – 49 Years	50 – 59 Years	60 – 69 Years	70 – 79 Years	80+ Years
All males	0	3	7	13	15	28	15	3
Asian males	0	0	0	0	1	3	0	0
Black males	0	3	4	7	6	12	3	0
Coloured males	0	0	0	0	6	5	2	1
White males	0	0	3	5	2	7	9	2

Group - Females 2014	0 – 19 Years	20 – 29 Years	30 – 39 Years	40 – 49 Years	50 – 59 Years	60 – 69 Years	70 – 79 Years	80+ Years
All females	0	1	5	7	20	13	7	8
Asian females	0	0	0	0	2	0	2	0
Black females	0	1	2	5	9	7	3	2
Coloured females	0	0	2	1	4	1	0	0
White females	0	0	1	1	4	5	2	6

N.B. In the event that the totals in any of the above tables do not tally, this may be the result of uncertainties as to the age, race or sex of the individual. The totals for 'all males' and 'all females', however, always reflect the correct totals.

Risk Factors for Duodenal Cancer

Diet and health history can affect the risk of developing small intestine cancer.

Anything that increases one's risk of getting a disease is called a risk factor. Having a risk factor does not mean that one will get cancer; not having risk factors also does not mean that one will not get cancer.

Risk factors for small intestine cancer include the following:

- Tobacco use
- Alcohol consumption
- Eating a high-fat diet
- High consumption of red meat
- Consumption of smoked foods
- High intake of salt
- Having Crohn disease
- Having celiac disease
- **Inherited conditions.** These are health issues that a person inherits from a parent. Those that may increase the risk of developing small intestine cancer include:
 - familial adenomatous polyposis (FAP)
 - Lynch syndrome
 - Peutz-Jeghers syndrome
 - Cystic fibrosis

Signs and Symptoms of Duodenal Cancer

Duodenal cancer, can cause a variety of symptoms, such as:

- unexplained weight loss
- abdominal pain
- bloody stools
- diarrhoea
- a lump in the abdomen

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- nausea
- vomiting
- weakness and fatigue
- anaemia, which is a low number of red blood cells
- jaundice, which causes the skin and the whites of the eyes to become yellow

However, having these symptoms does not mean that a person has cancer. A range of conditions can cause similar symptoms, including irritable bowel syndrome and inflammatory bowel disease. As these symptoms can suggest several different health conditions, a person should consult a doctor as soon as they appear.

Diagnosis of Duodenal Cancer

In addition to a physical examination, the following tests may be used to diagnose duodenal cancer:

Blood tests - a test of the number of red blood cells in the blood can indicate whether the cancer is causing any bleeding. Tests for your liver and kidney function may also be performed. The results will determine if either of those organs may be affected by the cancer and find out how healthy those organs are before having treatment for small bowel cancer.

X-ray - an X-ray is way to create a picture of the structures inside of the body using a small amount of radiation. It can help the doctor find a tumour.

Biopsy - a biopsy is the removal of a small amount of tissue for examination under a microscope. Other tests can suggest that cancer is present, but only a biopsy can make a definite diagnosis. A pathologist then analyses the sample(s). A pathologist is a doctor who specializes in interpreting laboratory tests and evaluating cells, tissues, and organs to diagnose disease.

Endoscopy - a test called an endoscopy allows the doctor to see the inside the gastrointestinal system. The person may be sedated while the doctor inserts a thin, lighted, flexible tube called an endoscope through the mouth, down the oesophagus, and into the stomach and small bowel.

Computed tomography (CT or CAT) scan - a CT scan take pictures of the inside of the body using x-rays taken from different angles. A computer combines these images into a detailed, 3-dimensional or 3-D image that shows any abnormalities or tumours. A CT scan can be used to measure the tumour's size.

Positron emission tomography (PET) or PET-CT scan - a PET scan is usually combined with a CT scan (see above).

Laparotomy - in this procedure, a surgical incision is made in the abdomen to check for disease. Sometimes, tissue samples are taken and, often, surgery is performed at the same time to remove the tumour.

Treatment of Duodenal Cancer

There are three types of standard treatment that may be used:

Surgery - surgery is the most common treatment of small intestine cancer. One of the following types of surgery may be done:

- Resection: Surgery to remove part or all of an organ that contains cancer.
- Bypass: Surgery to allow food in the small intestine to go around (bypass) a tumour that is blocking the intestine but cannot be removed.

After the doctor removes all the cancer that can be seen at the time of the surgery, some patients may be given radiation therapy to kill any cancer cells that are left. Treatment given after the surgery, to lower the risk that the cancer will come back, is called adjuvant therapy.

Radiation therapy - radiation therapy is a cancer treatment that uses high-energy x-rays or other types of radiation to kill cancer cells or keep them from growing. There are two types of radiation therapy:

- External radiation therapy uses a machine outside the body to send radiation toward the cancer.
- Internal radiation therapy uses a radioactive substance sealed in needles, seeds, wires, or catheters that are placed directly into or near the cancer.

The way the radiation therapy is given depends on the type of the cancer being treated. External radiation therapy is used to treat small intestine cancer.

Chemotherapy - is a cancer treatment that uses drugs to stop the growth of cancer cells, either by killing the cells or by stopping them from dividing. When chemotherapy is taken by mouth or injected into a vein or muscle, the drugs enter the bloodstream and can reach cancer cells throughout the body (systemic chemotherapy).

New types of treatment are being tested in clinical trials include:

Biologic therapy - is a treatment that uses the patient's immune system to fight cancer. Substances made by the body or made in a laboratory are used to boost, direct, or restore the body's natural defenses against cancer. This type of cancer treatment is also called biotherapy or immunotherapy.

Radiation therapy with radiosensitisers - radiosensitisers are drugs that make tumour cells more sensitive to radiation therapy. Combining radiation therapy with radiosensitisers may kill more tumour cells.

Oshima, K., Noguchi, K., Tomimaru, Y., Nagase, H., Ogino, T., Hirota, M., Oshima, K., Tanida, T., Noura, S., Imamura, H., Akagi, K., Iwazawa, T. & Dono, K. 2019. Clinicopathological study of 15 cases of primary duodenal cancer. *Gan To Kagaku Ryoho*. 2019 Feb;46(2):354-356. Japanese.

“There have been few reports discussing treatments for primary duodenal cancer. In this study, 15 cases of primary duodenal cancer that were treated by curative resection in our hospital between April 2005 and December 2017 were analyzed to study appropriate operative procedures. Prognostic analysis revealed that the median of relapse-free survival and overall survival were 49 months and 74 months, respectively. The 5-year survival rate was 47%. On univariate analysis of relapse-free survival, lymph node metastasis($p < 0.01$) and post-operative adjuvant therapy($p = 0.02$) were significant independent prognostic factors. Analysis of the relationship between lymph node metastasis and the depth or location of tumors suggested that pancreaticoduodenectomy with lymph node dissection should be performed to achieve radical resection, since there were some cases that involved lymph node metastasis around the pancreatic head or hepatoduodenal ligament.”

Yanagimoto, Y., Omori, T., Jeong-Ho, M., Shinno, N., Yamamoto, K., Takeuchi, Y., Higashino, K., Uedo, N., Sugimura, K., Matsunaga, T., Miyata, H., Ushigome, H., Takahashi, Y., Nishimura, J., Yasui, M., Asukai, K., Yamada, D., Tomokuni, A., Wada, H., Takahashi, H., Ohue, M., Yano, M. & Sakon, M. 2019.

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Page 5

BACKGROUND: Pancreatoduodenectomy is considered to be a very invasive treatment for early superficial duodenaltumors (SDTs), which have a lower risk of lymph node metastasis. Partial resection of the duodenum with endoscopic submucosal dissection for SDT resection is an attractive technique but it is associated with a high risk of complications. We describe our technique for SDT resection.

METHOD: It includes the following elements: freeing the transverse mesocolon, exposing and mobilizing the second part of the duodenum and the head of the pancreas (Kocher maneuver), confirming the location of the ulcer bed for endoscopic submucosal dissection, and laparoscopic suturing by hand in the seromuscular layer of the duodenum. We performed this technique in 10 patients between March 2015 and March 2017.

RESULTS: The median tumor diameter and resected tissue diameter were 36 (20-54) and 41 (25-60) mm, respectively. Curative resection (R0) with negative margins was achieved for all patients. There were no conversions to open surgery in this series. No postoperative complications were above grade 2 in the Clavien-Dindo classification system. No recurrences were observed during the medium-term follow-up period.

CONCLUSION: This technique is safe and feasible and can be an option for surgical SDT resection.

About Clinical Trials

Clinical trials are research studies that involve people. They are conducted under controlled conditions. Only about 10% of all drugs started in human clinical trials become an approved drug.

Clinical trials include:

- Trials to test effectiveness of new treatments
- Trials to test new ways of using current treatments
- Tests new interventions that may lower the risk of developing certain types of cancers
- Tests to find new ways of screening for cancer

The [South African National Clinical Trials Register](#) provides the public with updated information on clinical trials on human participants being conducted in South Africa. The Register provides information on the purpose of the clinical trial; who can participate, where the trial is located, and contact details.

For additional information, please visit: www.sanctr.gov.za/

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