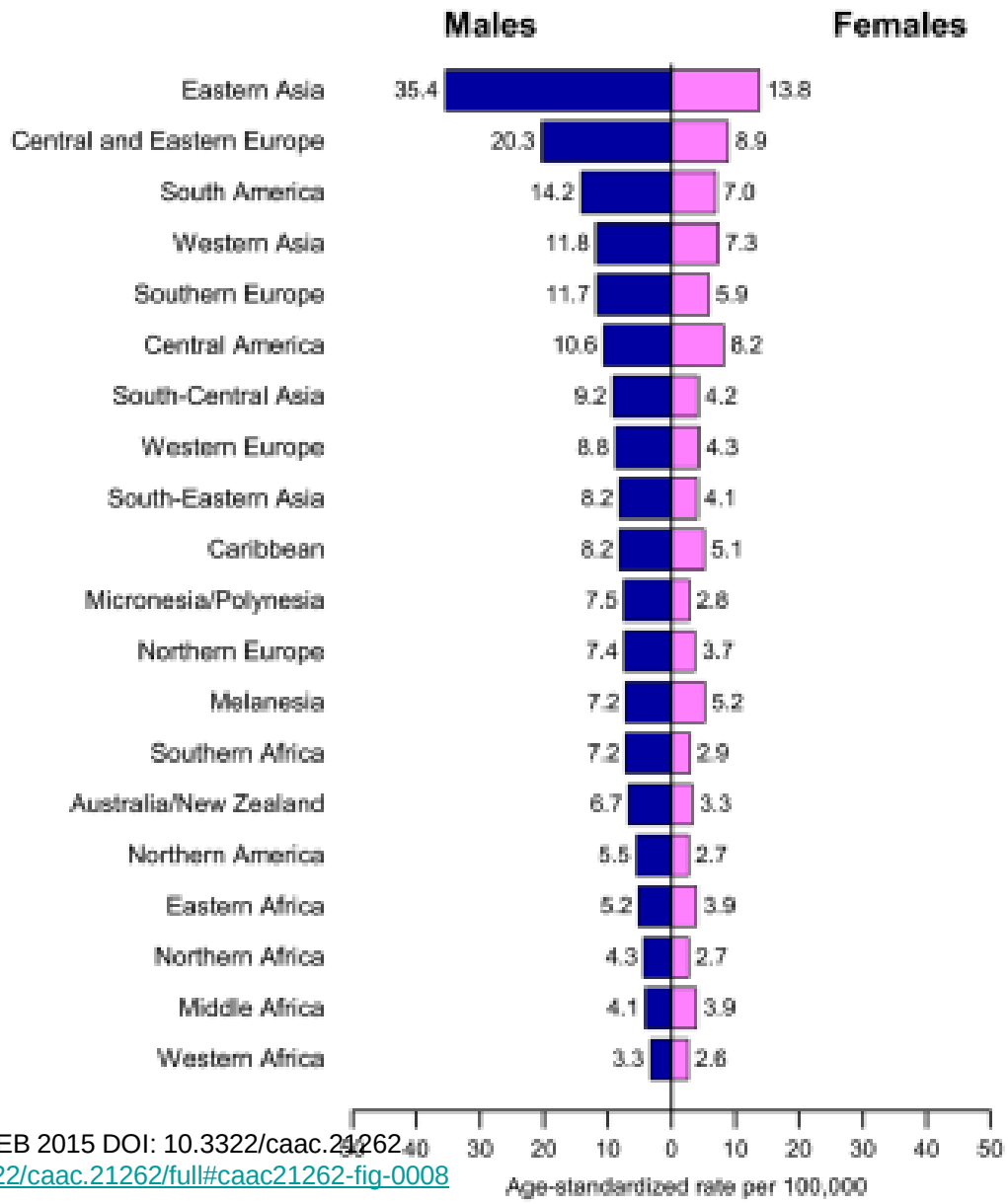
CARCINOMA OF THE STOMACH

The malignant tumor
developing from elements
of a epithelium mucous a stomach

Stomach Cancer Incidence Rates by Sex and World Area



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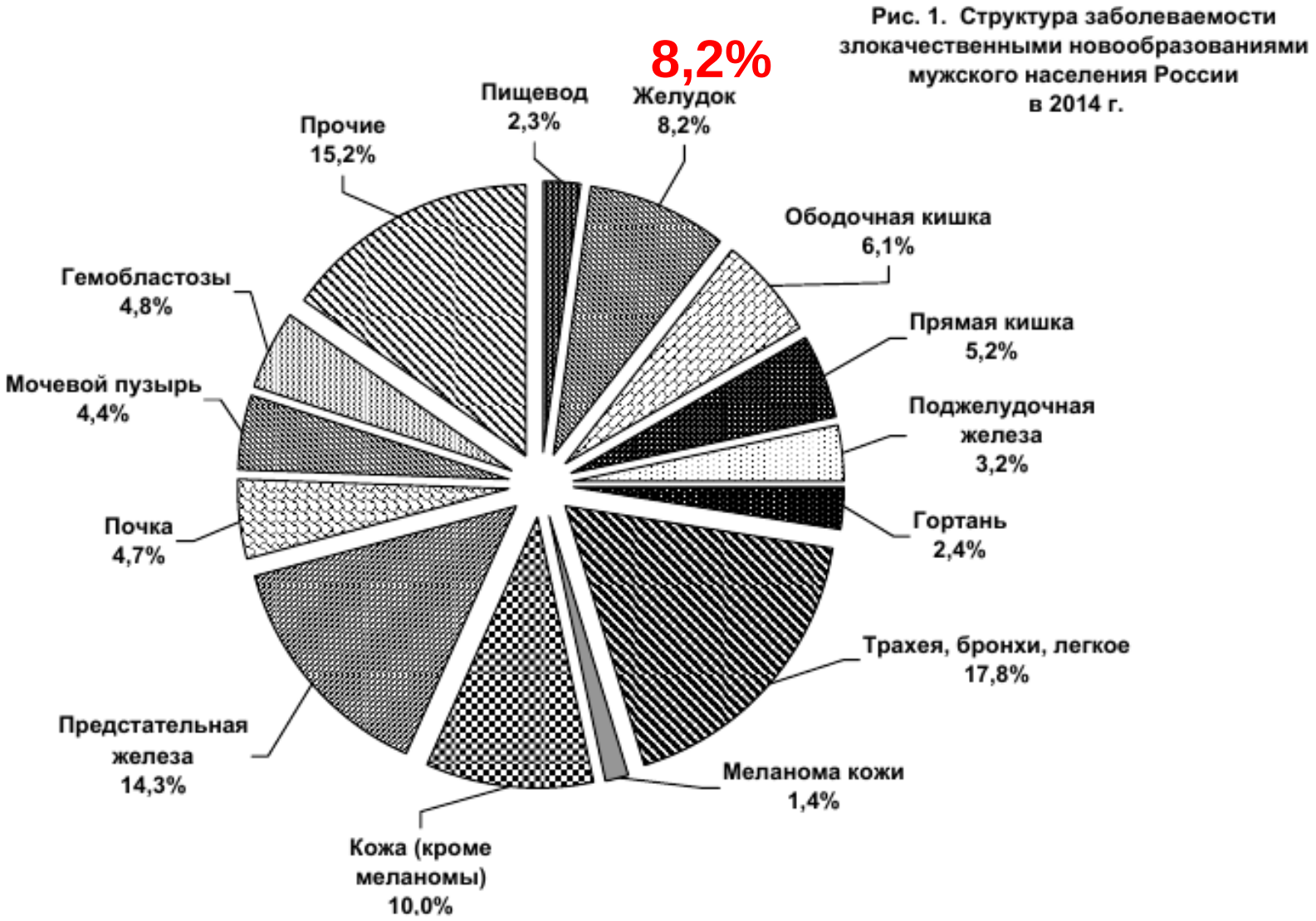
Geographic Distribution

- Highest rates (over 40 per 100,000 in males) are reported from Japan, China and certain countries in Latin America.
- The lowest rates (< 15 per 100,000) are seen in North America (specifically, its white population), India, the Philippines, most African countries, some countries in Western Europe, and Australia.
- 723 000 cases of death in year (3place in the world)

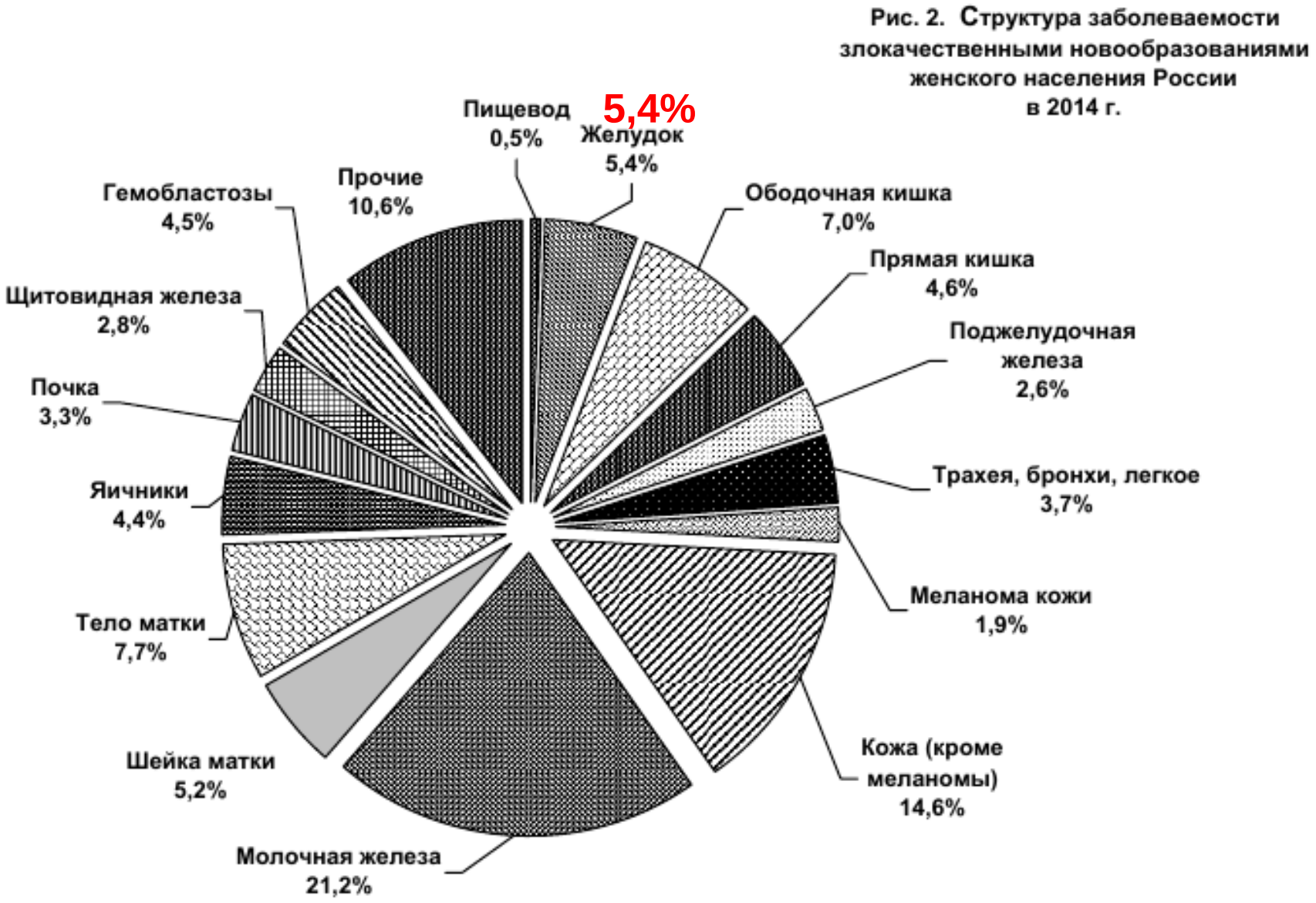
Динамика показателей заболеваемости населения России злокачественными новообразованиями в 2004-2014 гг.

Локализация, нозологическая форма	Годы											Среднегодовой темп прироста, %	Прирост, %
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014		
Оба пола («грубые» показатели на 100 000 населения)													
Все новообразования	**328,00**	**330,51**	**333,67**	**341,55**	**345,69**	**355,84**	**364,22**	**365,42**	**367,29**	**373,42**	**388,03**	**1,64**	**18,04**
Губа	2,96	2,83	2,70	2,51	2,49	2,42	2,36	2,07	1,97	1,89	1,82	-4,87	**-38,38**
Полость рта	4,53	4,49	4,55	4,78	4,89	5,08	5,18	5,37	5,36	5,55	5,77	2,58	**30,09**
Глотка	2,86	2,84	2,90	3,02	3,03	3,22	3,22	3,07	3,25	3,28	3,44	1,76	**19,46**
Пищевод	5,07	4,99	4,96	5,03	5,04	5,03	5,20	5,17	5,10	5,16	5,18	0,37	**3,82**
Желудок	30,99	30,56	29,43	29,51	28,61	28,41	28,03	26,8	26,10	25,99	25,88	-1,93	**-17,43**
Ободочная кишка	20,36	20,89	21,15	21,68	22,35	22,78	23,24	23,6	23,91	24,24	25,59	2,10	**23,80**
Прямая кишка, ректосигмоидное соединение, анус	15,97	16,61	16,58	16,83	16,9	17,64	18,02	18,00	18,38	18,36	19,03	1,62	**17,79**
Печень и внутрипеч. желчные протоки	4,60	4,57	4,34	4,43	4,56	4,67	4,55	4,56	4,39	4,73	4,96	0,56*	**5,82***
Желчный пузырь и внепеченочные желчные протоки	2,09	2,23	2,15	2,17	2,31	2,18	2,37	2,32	2,23	2,30	2,38	0,94	**9,94**
Поджелудочная железа	9,33	9,36	9,28	9,88	9,93	10,37	10,59	10,43	10,61	10,69	11,44	1,93	**21,62**
Полость носа, среднее ухо, придаточные пазухи	0,63	0,64	0,64	0,65	0,67	0,64	0,63	0,66	0,66	0,67	0,69	0,64*	**6,64***
Гортань	4,78	4,55	4,67	4,57	4,74	4,63	4,71	4,68	4,72	4,62	4,55	-0,10*	**-1,03***
Трахея, бронхи, легкое	41,39	40,6	40,16	40,23	39,99	40,2	40,15	39,19	38,74	39,06	39,48	-0,50	**-4,85**

Structure of cancer cases of men in Russia in 2014.



Structure of cancer cases of women in Russia in 2014.



Etiology

1. Chemical factors

- Nitrates and nitrites (vegetables, marinated, refried, smoked, spicy foods, spices)
- Alcohol (not direct carcinogen. Causes defeat mucous stomach and leads to chronic gastritis)
- Existence in the soil of copper, molybdenum, cobalt
- Substances of a tobacco smoke (2002 International agency on studying of cancer)
- Products of digestion of fats

2. Infectious

- Epstein-Barre's virus (cardia cancer is more often)
- Helicobacter pylori carcinogen of 1 order.

Antral cancer is more often. Or marker?

3. Genetic

- Mutant gene E-kadkherin (CDH–1)
- b-katenin
- gene polypose of a large intestine

Factors increasing the risk of gastric cancer:

- blood group of A(II)
- pernicious anemia
- family carcinoma of the stomach
- syndrome of a hereditary carcinoma of the stomach of diffusion type
- Li-Fromeni's syndrome - hereditary cancer
- syndromes digestive tract polyps: family adenomatous polyposes of a large intestine Gardner's syndrome, Peyttsa-Egers's syndrome, family juvenile polyposes.

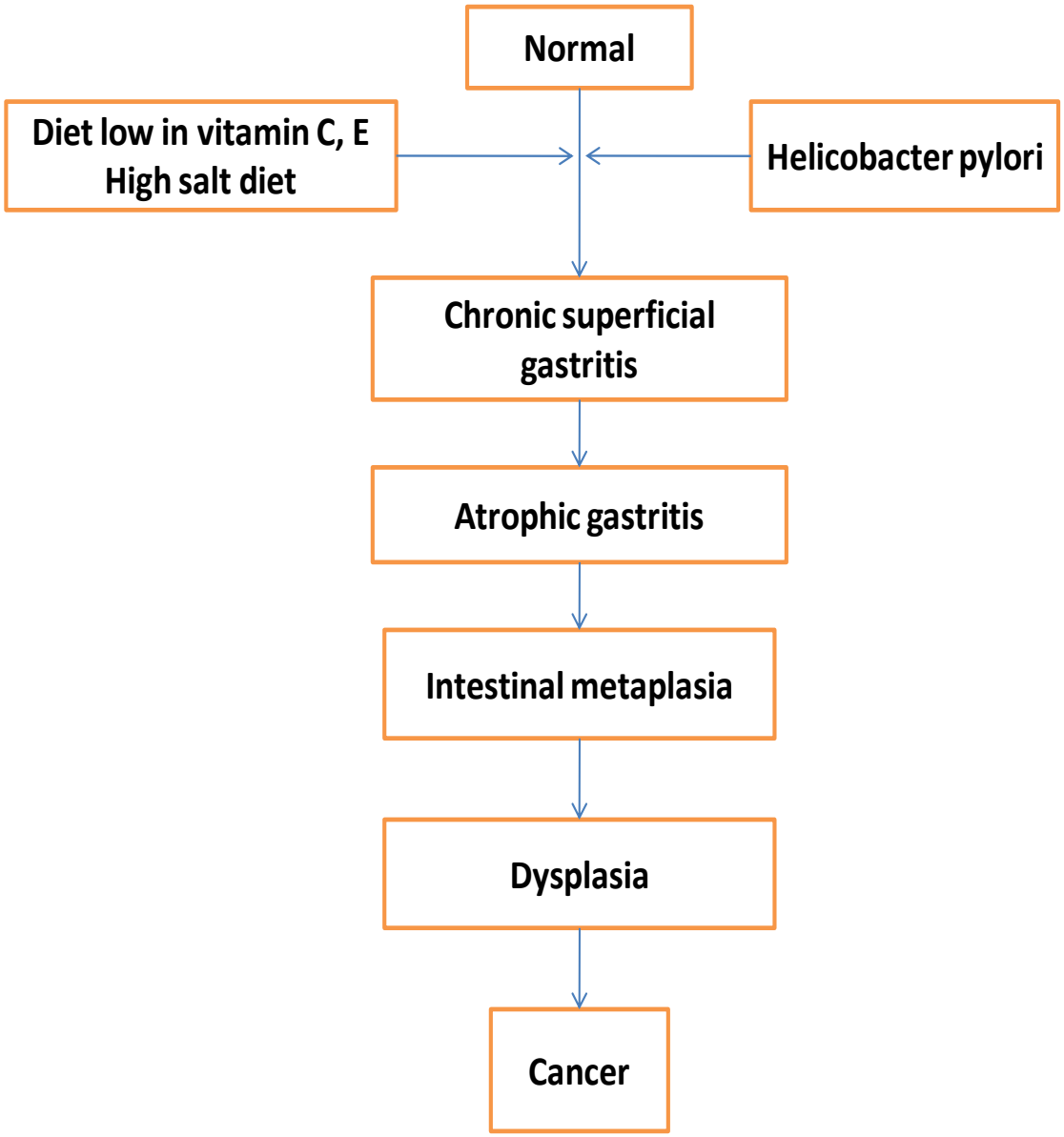
2. Environmental factors:

1. Professional harm: production of rubber, coal, asbestos, vinyl chloride, mineral oils, chrome, etc.
2. Tobacco smoking (data International Agency on studying of cancer of 2002).
3. The ionizing radiations.
4. A state after GEA and a resection of a stomach (especially in 10-20 after a resection according to Billroth 2).
5. Obesity.
6. Wrong diet, alcohol intake, and also salty, spicy, smoked, **food and liquid hot 60 degrees Celsius**.

Precancerous diseases and conditions:

1.Chronic atrophic gastritis (90%)
2.Infection with Helicobacter pylori.
3.Adenomatous polyps and polyposis of the stomach (8%). The frequency of malignancy is 40% in polyps greater than 2 cm in diameter.
4. Hyperplastic polyps about 2%.
5. Chronic callous gastric ulcer (less than 1%).
6.Menetrier disease (hyperplastic gastritis).
7.Barret's esophagus with gastro-esophageal reflux.
8. Immunodeficiency, especially not classified variable immunodeficiency (risk of cancer - 33%).
9. Intestinal metaplasia of the epithelium.
10. The presence of dysplasia of gastric epithelium.

Chronic helicobacter pylori infection increases the risk of gastric cancer about threefold when compared to uninfected patients.



Classification of gastric cancer
1.Localization:

1.Gastroesophageal cancer II type and type III (more than 50% of tumor above the dentate line of the esophagus)

2.The body of the stomach (the area of small and large curvature, the anterior and posterior walls)

3.Antrum

2. Pathological.

Bormann's Classification: 1926

Type I (polypoid carcinoma)	clearly demarcated, ulcerated, late metastasis, good prognosis.
Type II (ulcerating carcinoma)	sharply defined margins; difficult to differentiate from benign ulcer, requires biopsy, good prognosis.
Type III (ulcerating and infiltrating)	no clear-cut margins, submucosal infiltration, extends to serosa; most common gross type, relatively poor prognosis.
Type IV (diffuse infiltration):	early metastasis; includes linitis plastica (leather-bottle stomach); poorest prognosis.
Type V	unclassified

3. Histological

- Adenocarcinoma - the most common form (95%)
- Papillary adenocarcinoma presented a narrow or wide epithelial outgrowths of the connective tissue on the basis of
- Tubular adenocarcinoma is a branched tubular structure enclosed in the stroma (high and usernotification).
- Poorly-differentiated adenocarcinoma
- Mucinous adenocarcinoma - contains a significant amount of mucus.
- Signet ring cell adenocarcinoma. The tumor cells contain a lot of mucus.
- Adrenosquamous cell adenocarcinoma.
- Squamous cell carcinoma.
- Carcinoid.
- Undifferentiated cancer.

Sarcoma: Non-Hodgkin's lymphoma, lymphogranulomatosis), leiomyosarcoma, undifferentiated sarcoma is less than 1%.

Stomach 7th edition

T1	Lamina propria, submucosa
T1a	Lamina propria
T1b	Submucosa
T2	Muscularis propria
T3	Subserosa *(was T2b)*
T4a	Perforates serosa *(was T3)*
T4b	Adjacent structures
N1	1 to 2 nodes
N2	3 to 6 nodes *(was N1)*
N3a	7 - 15 nodes *(was N2)*
N3b	16 or more *(was N3)*

Changes from 6th edition

Stage IA	T1	N0
Stage IB	T2	N0
	T1	N1
Stage IIA	T3	N0
	T2	N1
	T1	N2
Stage IIB	T4a	N0
	T3	N1
	T2	N2
	T1	N3
Stage IIIA	T4a	N1
	T3	N2
	T2	N3

Stages IIIB, IIIC, IV...

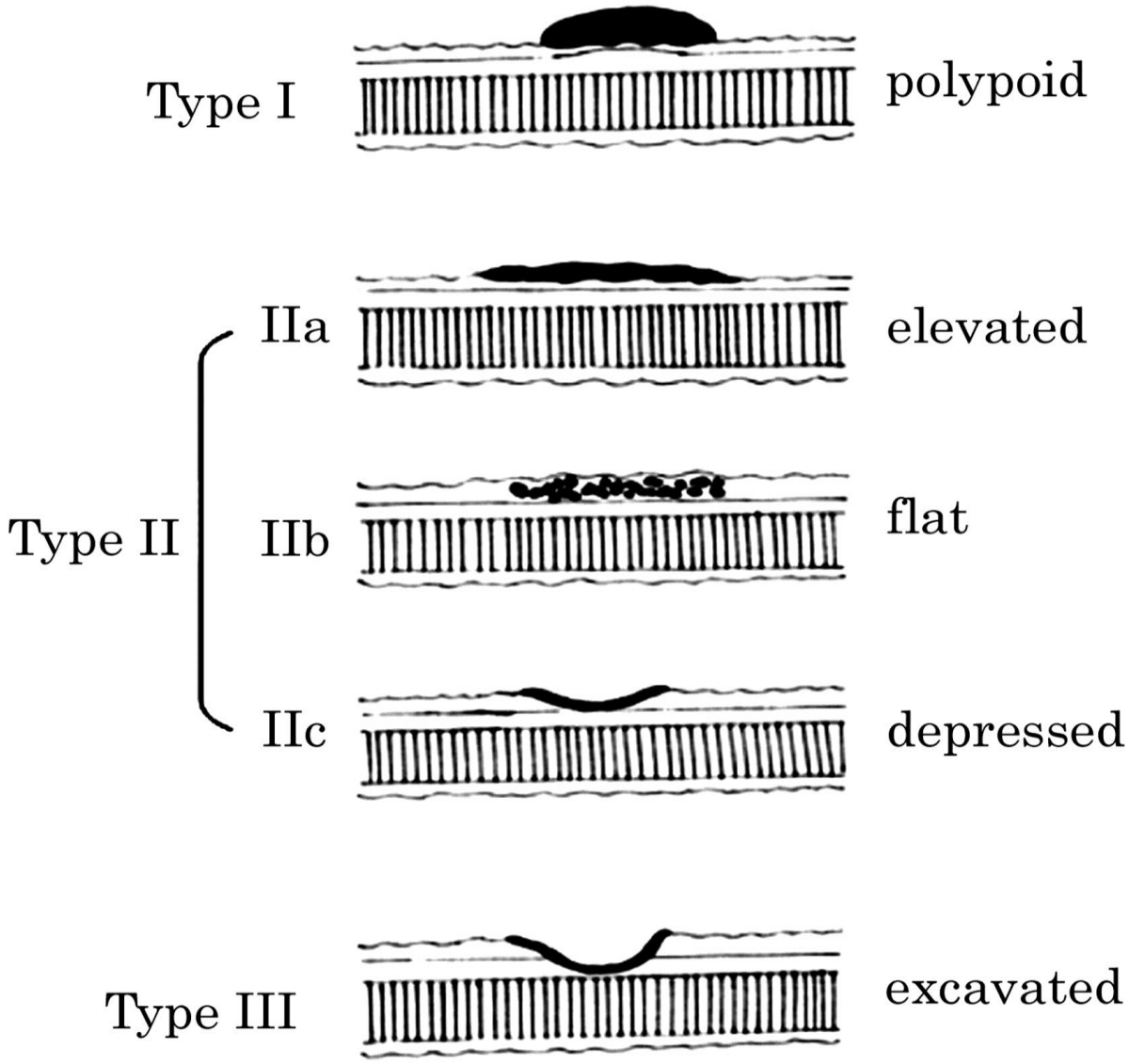
Stages: most changed

T4 Serosa (visceral peritoneum) or adjacent structures
T4A Serosa (visceral peritoneum)
T4b Adjacent structures such as spleen, transverse colon, liver, diaphragm, pancreas, anterior abdominal wall, adrenal gland, kidney,small intestine, retroperitoneum.
M0 No distant metastasis
M1 Presence of distant metastases

Early gastric cancer. Endoscopic classification of early gastric cancer of the Japanese Endoscopic Society

Type 0 - superficial flat tumors:

- **0-I** - the sublime (the height of the tumor in two and more times exceeds the thickness of the mucous membrane).
- **0-II** - surface: 0-IIa - elevated type; 0-IIb - flat type; 0-IIc - in-depth.
- **0-III** - ulcerative defect mucous membrane



Endoscopic classification of early gastric cancer of the Japanese Endoscopic Society

DIAGNOSIS OF GASTRIC CANCER

1. **Clinical**.
2. **Laboratory** (tumor markers (CA 72-4, CEA, CA19-9) low sensitivity and specificity, increases in stages III-IV)

3.Instrumental :

1. fibrogastroscopy with morphological verification (biopsy)
2. Chromoendoscopy, fluorescence endoscopy.
3. fibrogastroscopy +ultrasound.
4. Polypositional fluoroscopy and radiography double-contrast.
5. Ultrasound of the stomach and abdominal cavity, retroperitoneal space, small pelvis, and supraclavicular regions (lnd).
6. CT of the abdomen, PET imaging.
7. Diagnostic laparoscopy with biopsy.

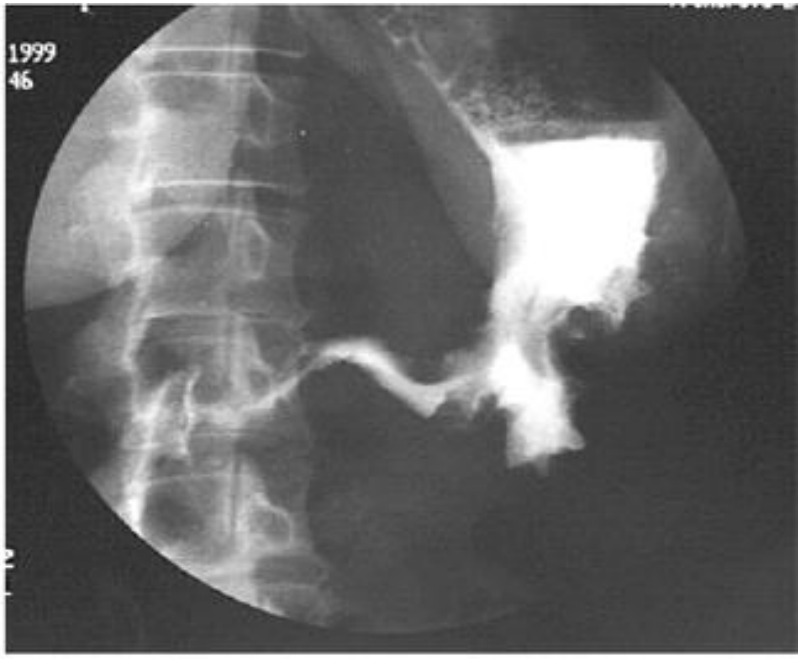
4.Laparotomy, revision of the abdominal cavity.

Рак желудка

Endoscopic ultrasound (EUS) is helpful in staging GC

Gastric cancer lesion confined to mucosa layer

а



б

A series of radiographs of the stomach in a patient with gastric cancer.

Visible filling defects, a significant narrowing of pylorus of a stomach, impaired evacuation of contrast

Treatment of gastric cancer

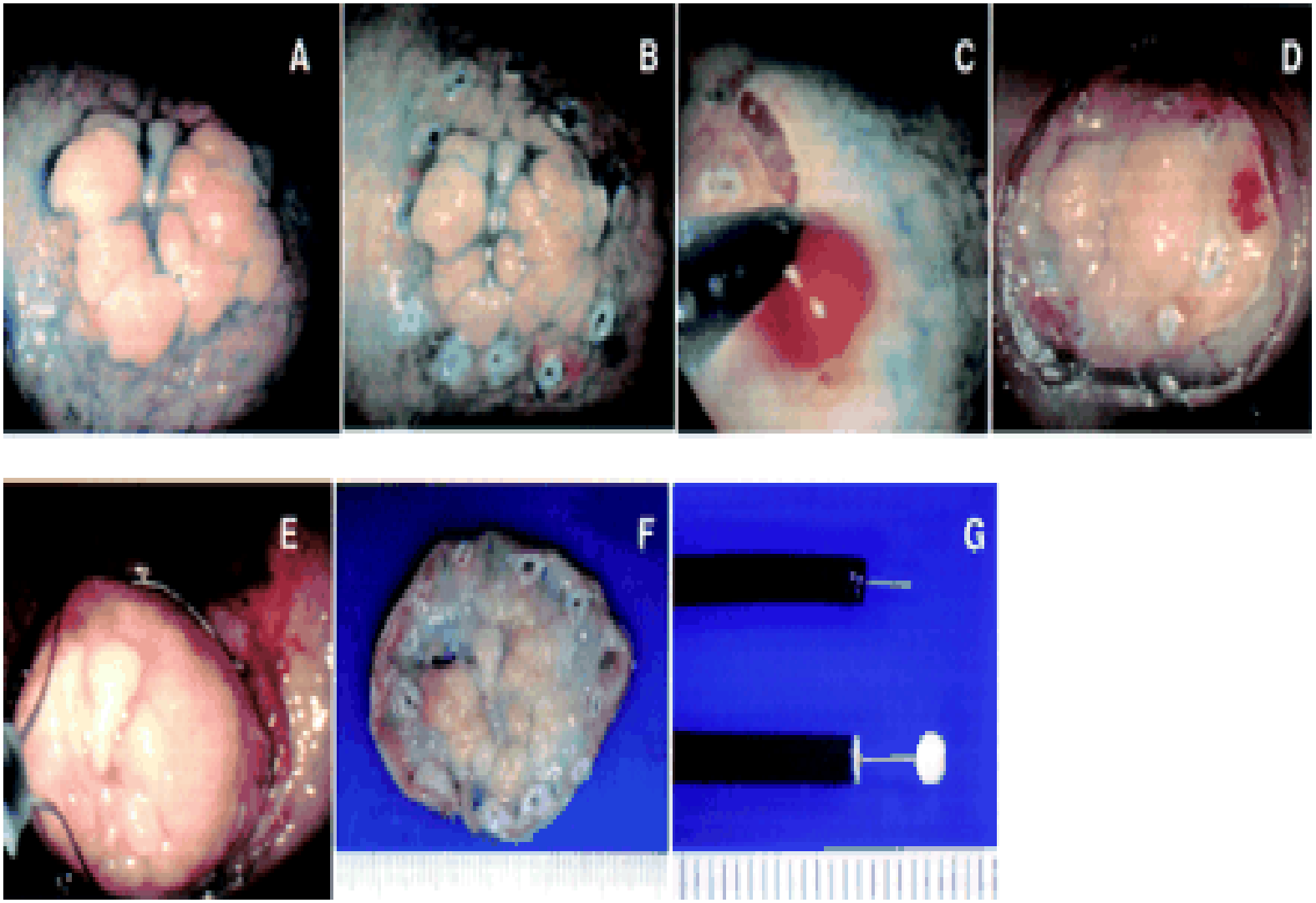
The leading method of treatment to date is surgical.

Early cancer: well-differentiated adenocarcinoma without evidence of mts in lnd and Mo:

types I-II (a, b) up to 2-3 cm, IIc up to 1 cm - endoscopic resection. Alternative to laser destruction, photodynamic therapy.

Type IIIc – economical resection with lymph node dissection.

Endoscopic mucosal resection

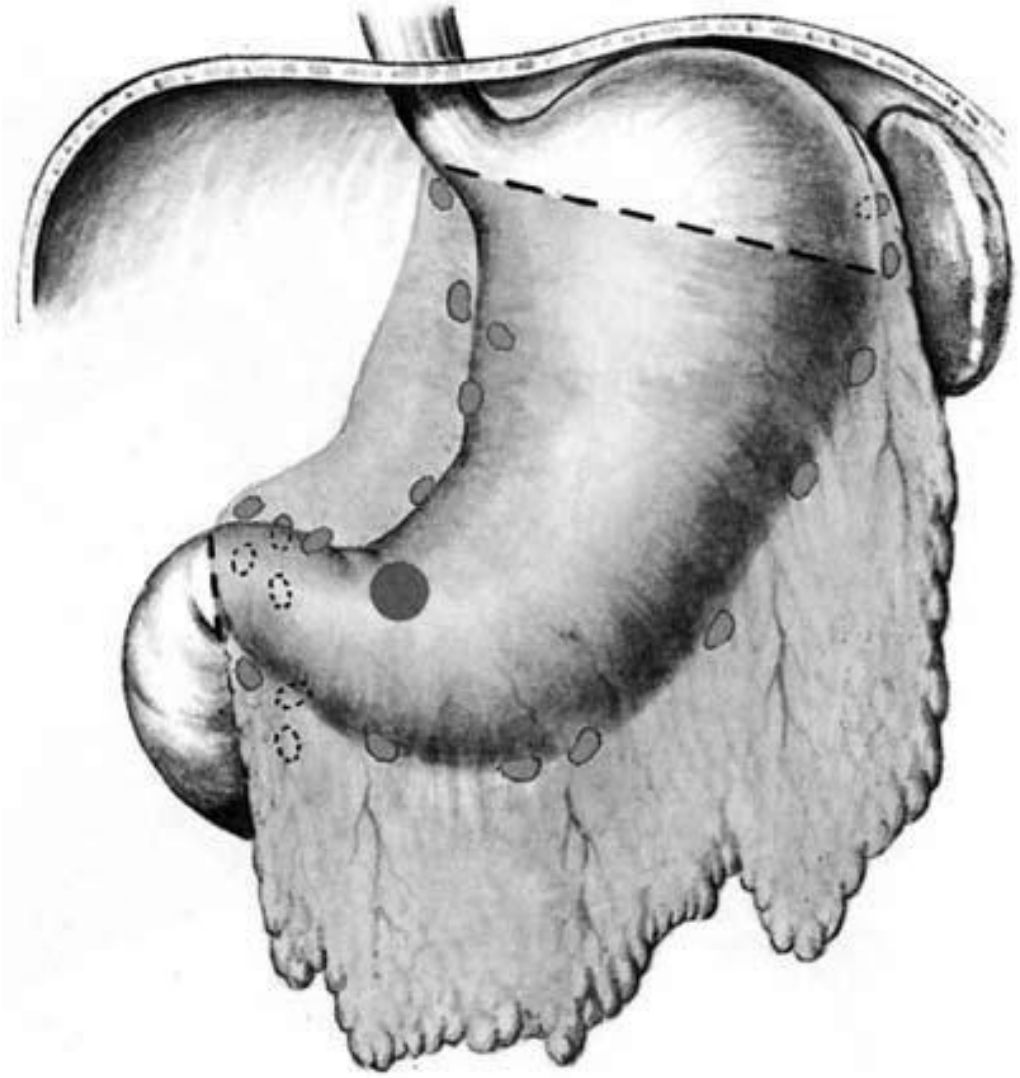


Radical surgical treatment

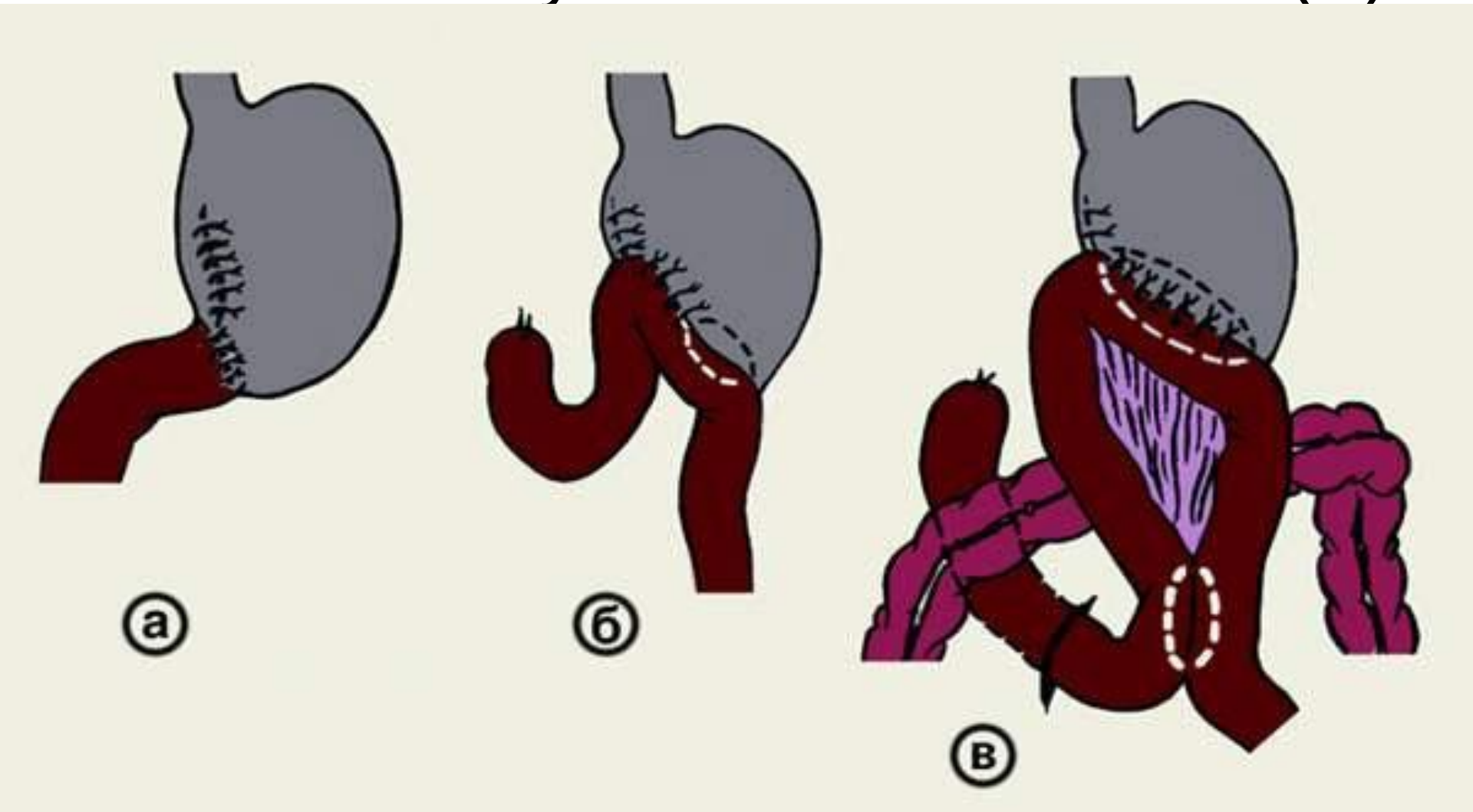
(stage I-III) possible only for 30% patients:

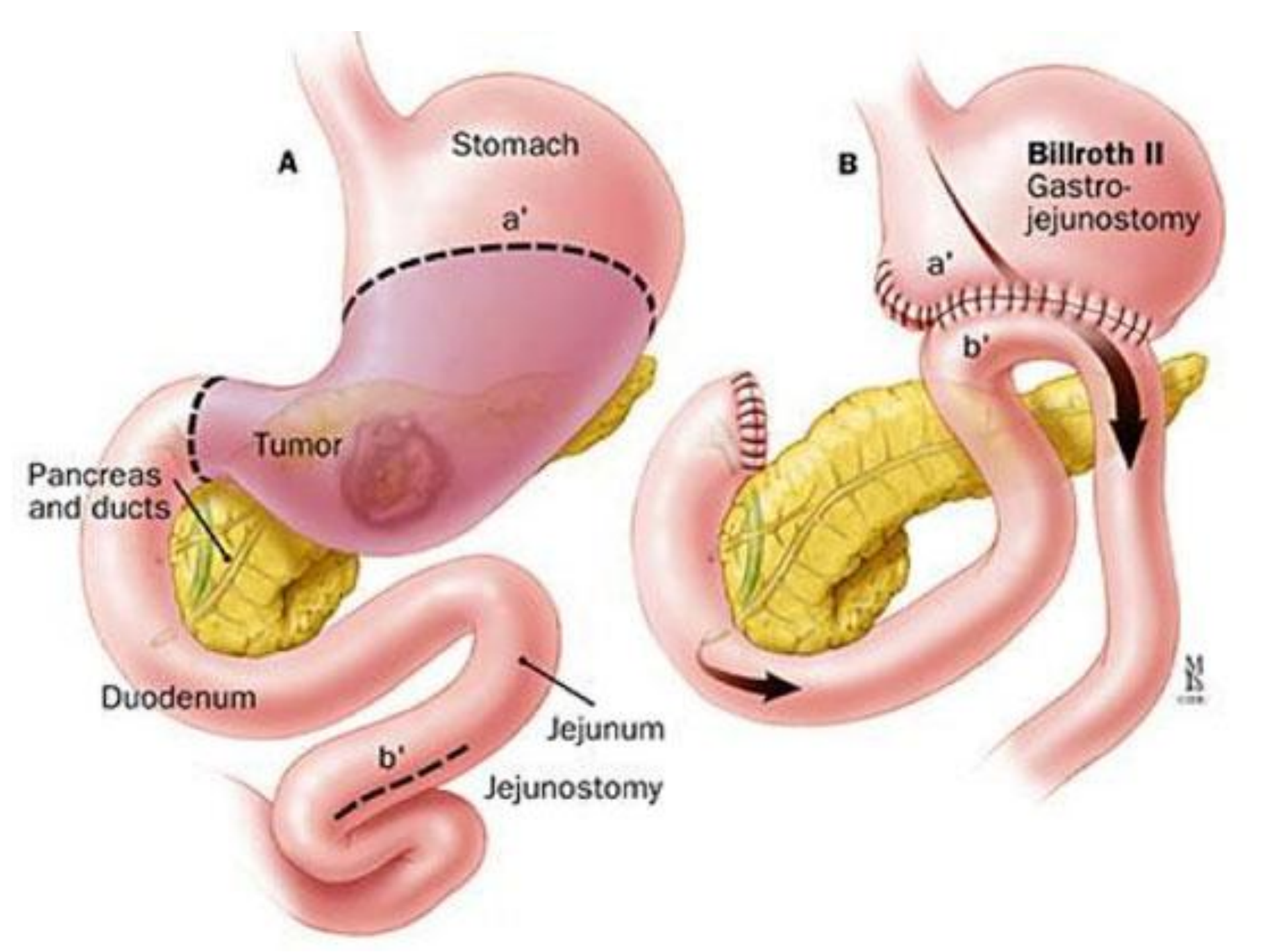
- Proximal Subtotal resection
- Distal Subtotal resection
- Gastrectomy, also
- Combined resection and combined gastrectomy (with splenectomy, resection of the colon, pancreas, and others organs).
- Evisceration of the left upper quadrant of the abdominal cavity (left upper abdominal evisceration), including gastrectomy, splenectomy, Subtotal pancreatectomy, bowel resection, left adrenalectomy traumatic and not usually used.

Distal Subtotal resection with lnd dissection D1

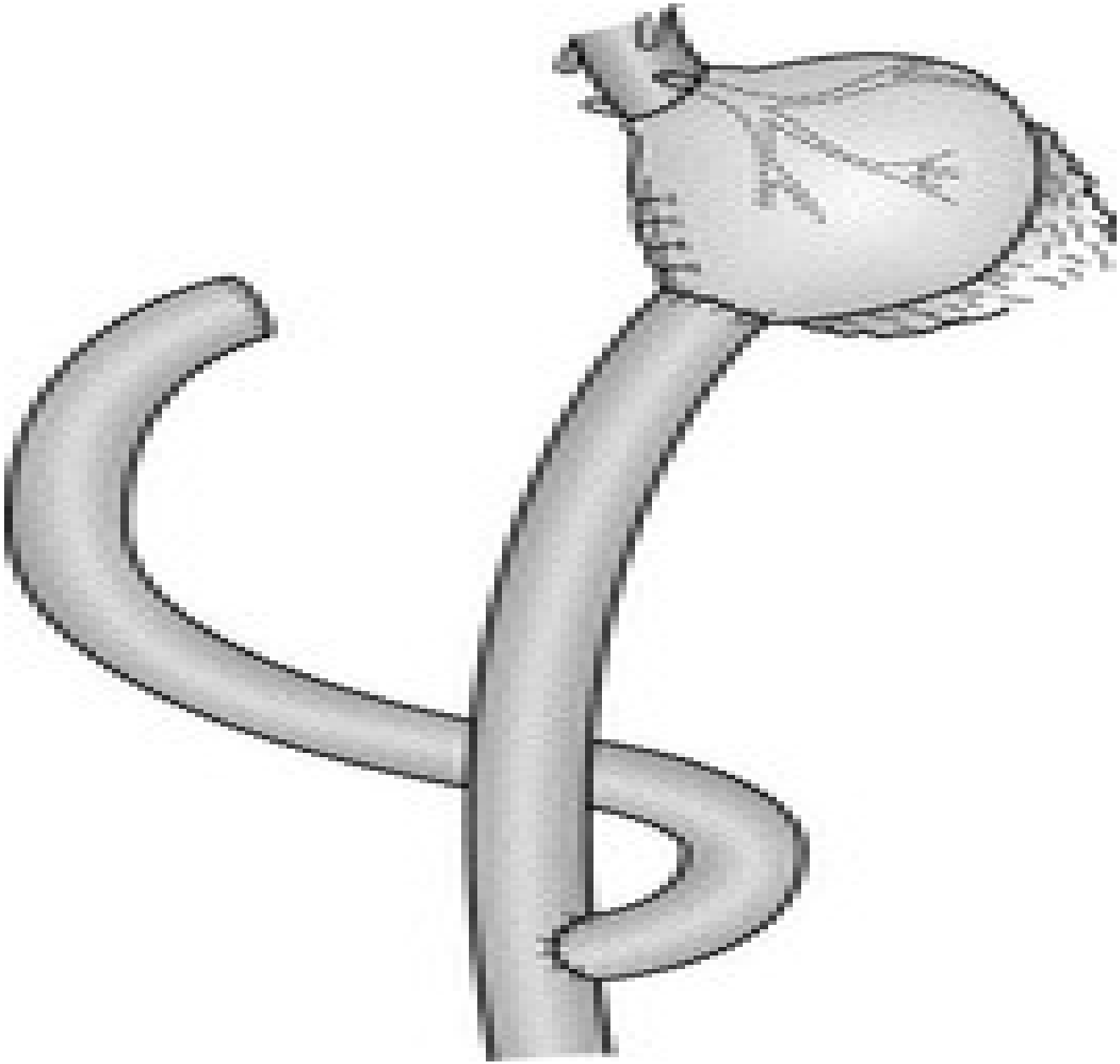


Distal Subtotal resection types Billroth I(A)(rarely) and Billroth II in modification by Hofmeister-Finsterer (B)

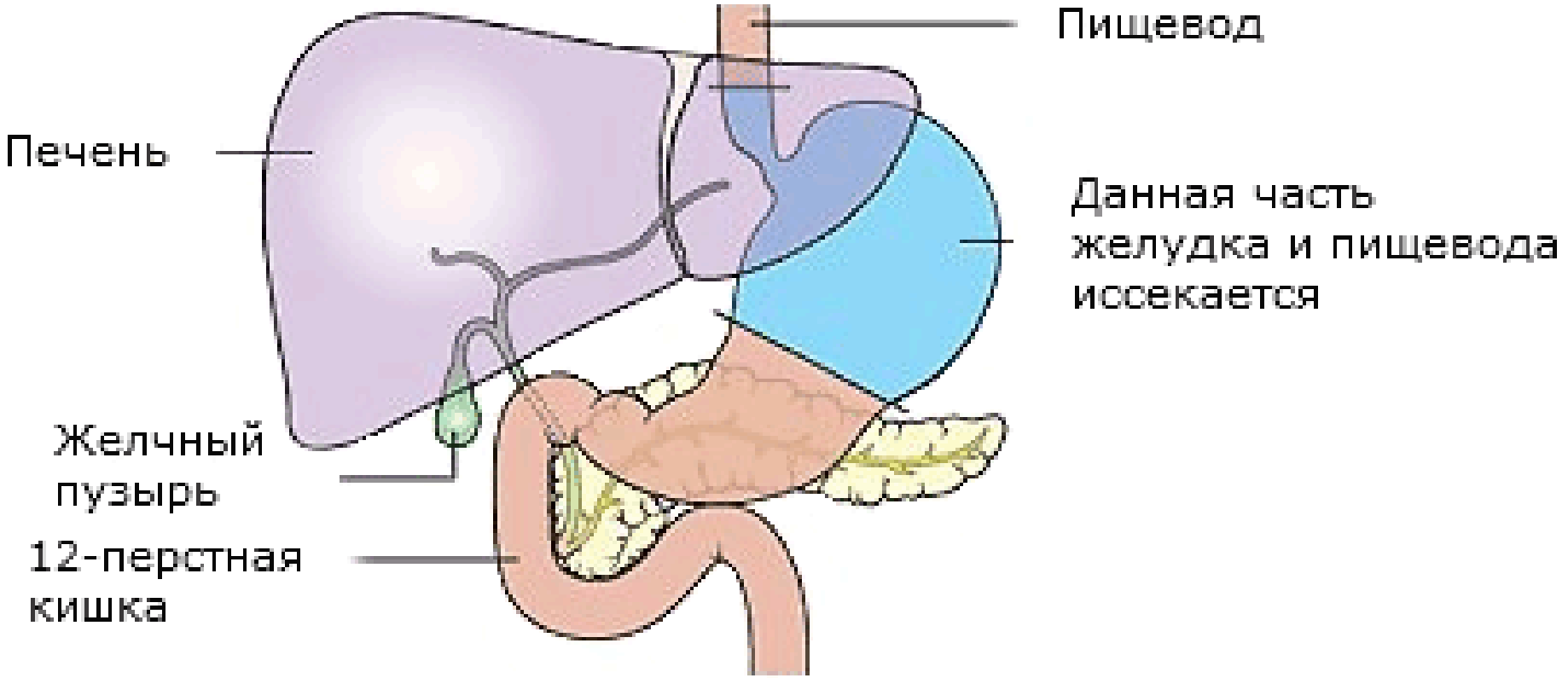



A
Stomach
a'
Tumor
Pancreas
and ducts
Duodenum
Jejunum
b'
Jejunostomy
B
Billroth II
Gastro-
jejunostomy
a'
b'

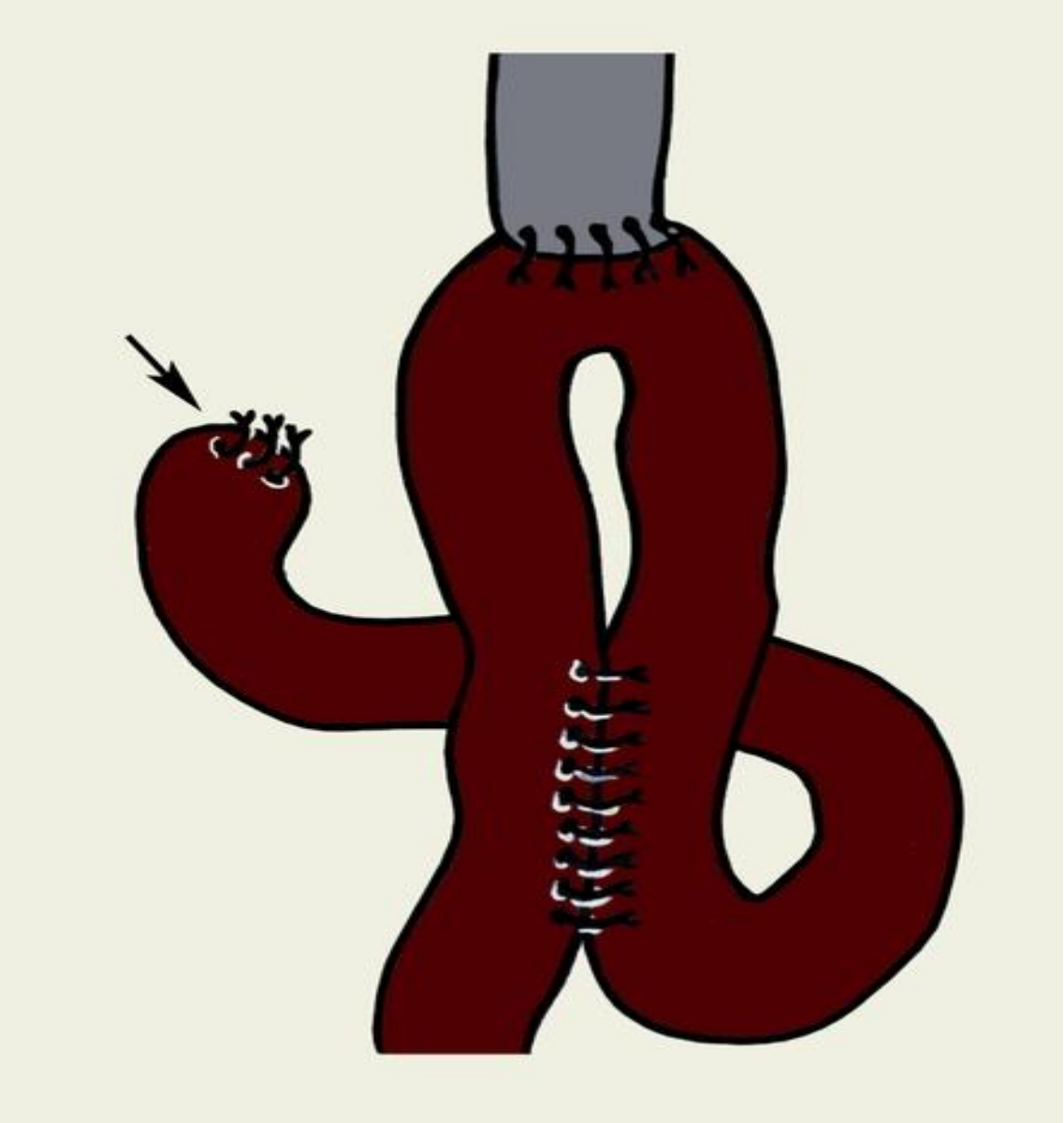
Roux-en-Y reconstruction

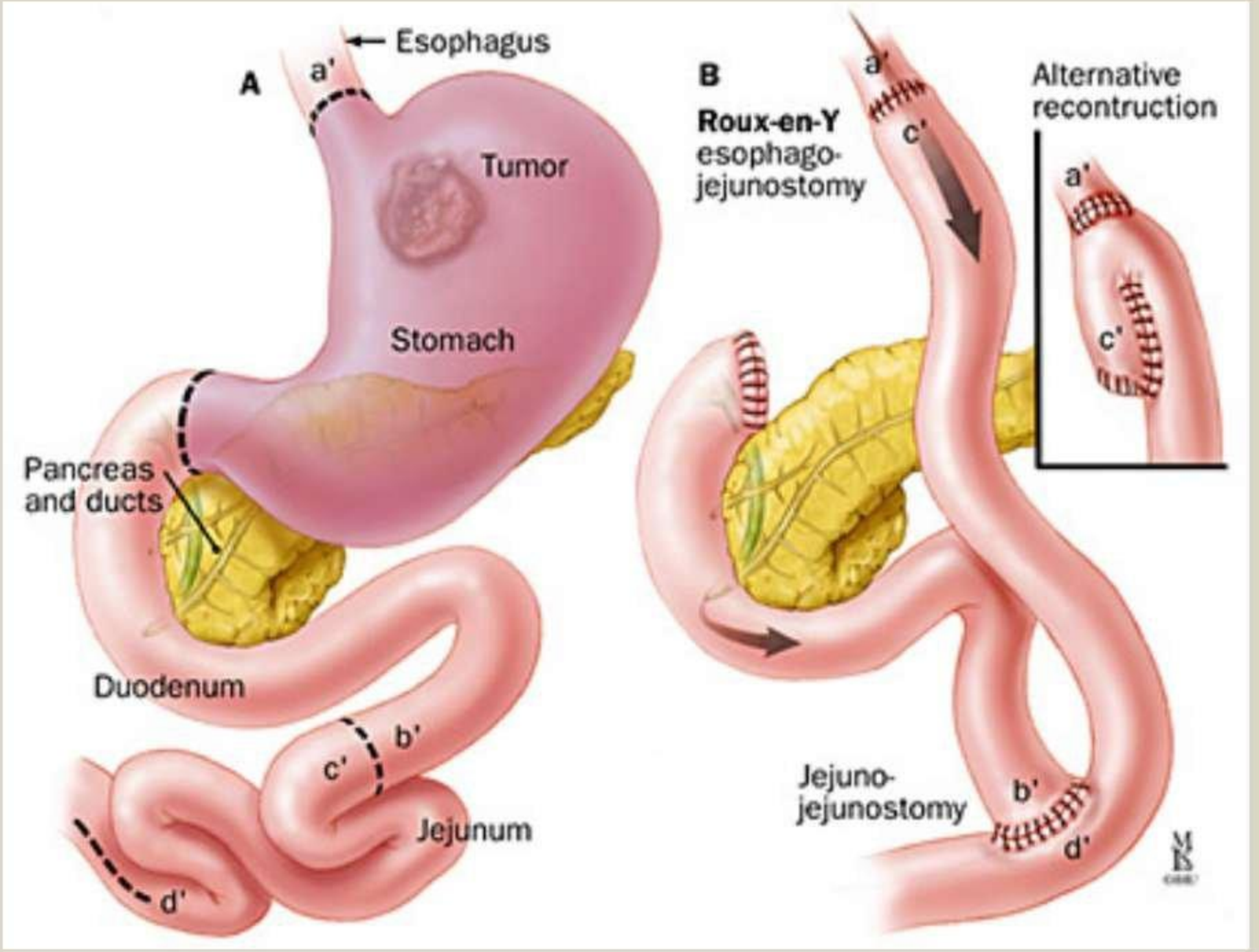


Proximal Subtotal resection, esophagoenteroanastomosis



Total gastrectomy, esophagojejunal - anastomosis by type of end-to-side




A
Esophagus
a'
Tumor
Stomach
Pancreas
and ducts
Duodenum
b'
c'
Jejunum
d'
B
Roux-en-Y
esophago-
jejunostomy
a'
c'
Alternative
recontruction
a'
c'
Jejuno-
jejunostomy
b'
d'

Gastrectomy, lymphodissection D2

Chemotherapy

- Medicinal treatment of localized stages is not carried out
- Neoadjuvant (reduces the incidence but does not improve survival)
- Adjuvant improves survival
- It is possible to conduct chemoradiotherapy in locally advanced forms (radiation therapy + 5-fluorouracil ± leucovorin). Treatment of incompletely operated patients remains palliative

Palliative surgery for stomach cancer

1.Gastroenterostomy (stenosis of the pylorus)

2. Gastrostomy (stenosis of the cardia, for food):

-temporary (Kader, Ho Dac Di, etc.)

-constant (the Hans, Toprover, Sapozhkov, Serebrennikov etc.)

3. Jejunostomy (for Midle, Roux, etc.) if you cannot create gastrostomy

4. Gastrotomy and stop bleeding

5. Suturing of the perforation of the tumor

Patients with stage IV disease are candidates for palliative chemotherapy.

Drug treatment of patients with distant metastases (M1)

• Commonly used modes, including cisplatin,fluorouracil and anthracyclines. At stage 4 with distant mts extends the life up to 12 months. Use a combined (PCT): cisplatin, fluorouracil, doxorubicin, methotrexate, leucovorin, calcium folinate etc. The efficiency of 17-30%

Recent wider use of taxanes, irinotecan, capecitabine, docetaxel. Efficiency up to 37%.

Radiation therapy in adjuvant regimen.

Prevention of gastric cancer

- Elimination of the influence of harmful environmental factors, diet, lifestyle, including Smoking cessation, alcohol primary prophylaxis.
- Early detection and treatment of precancerous lesions;
- dispensary observation of patients from risk groups, including arrivals from endemic areas (secondary prophylaxis)