CONCERNING THE X-RAY DIAGNOSIS OF THE PROLAPSE OF THE GASTRIC MUCOSA INTO THE BULBUS DUODENI

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The first report on prolapse of the gastric mucosa into the bulbus duodeni is made by V. Schmieden (30), who observed it during operation on a patient with pyloric block. Later, Eliason, E. L., Pendergrass, C. and Wright, M. (14) were the first to describe the roentgenographic signs of the cases with prolapse observed by them, likewise proved during operation. Following this initial period, a substantial number of publications on this issue appear in pertinent radiological literature, in which many controversial problems are dealt with concerning the etiology, clinical picture and X-ray symptomatology of the gastric mucosa prolapse.

The etiopathogenesis of the mucosal prolapse of the stomach is as yet insufficiently well clarified. According to some writers, an important role in the occurrence of this condition is played by the presence of an inflammatory process in the submucosal layer, its higher incidence in chronic hypertrophic gastritis being accordingly stressed. Another group of authors, however, contests the latter statement, emphasizing the fact that prolapse of the gastric mucosa into the bulbus duodeni has been also established during examination of completely healthy individuals, subjected to investigation with the special purpose of finding out an eventual prolapse (13).

Scott, W. (31), Reinberg and Schechter (6) and others consider the anatomical structure of the submucous layer of the stomach as a basic cause for the occurrence of the prolapse, being made up of loose connective tissue, conditioning a greater mobility of the mucosal folds and consequently, a possibility for easier penetration into the bulbus. According to Scott, W. (31) hyperperistalsis of the stomach likewise contributes for the prolapse.

The pathoanatomical observations of Shuliakovskaya, Sherer and others demonstrate a loosening of mucosal folds with increased mobility not merely in the prepyloric portion of the stomach, but in other parts as well — a finding explained with congenital weakness of adhesions of contiguous gastric layers.

Rather contradictory data are reported in literature concerning the incidence of gastric mucosa prolapse — from 0.13% to 6.7% (4, 2, 9). According to Bartels, E. and Eltorn (13), the female to male ratio of affection is approximately equal, with a predomination of the 30—40 years age-group. In our series, comprising 32 patients with prolapse of the gastric mucosa, the prevalence of the male sex is insignificant — 18 men and 14 women — the most frequently involved age being between 25—45 years. Our youngest patient is 13-year-old.
The clinical picture in prolapse of the gastric mucosa is most variable. Usually, the patients complain of a sense of heaviness and painfulness in the epigastrium, occurring at different time intervals. Occasionally, the pains are rather severe, colic-like accompanied by nausea or vomiting and scarcely responding to drug therapy. Acute pains are recorded more often after meals, regardless of the type of food received.

Phenomena characteristic for stenosis of the pylorus might be accompanied by melena and eventually hematemesis, though more seldom.

The treatment of prolapse is dependent upon the degree of clinical manifestations. In instances of frequently recurring acute pains, recalcitrant hemorrhages and pyloric stenosis phenomena it is necessary to resort to operation — gastrotomy with excision of mucosal folds (31), or partial resection of the stomach (3, 25, 34).

The X-ray investigation has a decisive importance in establishing the diagnosis „prolapse of the gastric mucosa“. In the majority of the cases the diagnosis is readily made, owing to the characteristic features of the defect produced by the protrusion of mucosal folds into the bulbus. Diagnostical difficulties might be encountered merely in proving partial protrusion of the mucosal folds, as the latter are promptly returned into the stomach and could not be clearly detected on fluoroscopy. If the roentgenologist does not await the next phase of prolapse of the folds, with a view to carry out recordings on serial target roentgenograms, the partial protrusions might be missed.

A characteristic defect in filling up is produced in the bulbus in protrusion of a greater part of the mucosal folds, similar (according to some authors) to an umbrella, mushroom, parachute etc. A characteristic feature of this
defect is the alteration of its form, size and localization in the course of investigation. In careful examination of the defect, it is established that the latter consists of isolated tortuous radiolucencies, corresponding to the prolapsed mucosal folds. During fluoroscopy or roentgenography, demonstration of their connection with the folds of the prepyloric portion of the stomach is possible; in closed pylorus they appear isolated by the folds in the antrum, but when the opening of the latter occurs, they are traced up through the pylorus in the direction of the antrum, resembling bright minute bands with typical appearance of mucous folds, fusing with the folds of the antrum.

Three degrees of protrusion into the bulbus are described by Zimmer, E. A. (34) in cases of prolapse of folds from the stomach into the bulbus: prolapse of isolated single fold; unilateral — partial prolapse and total — circular prolapse.

In protrusion of a single fold, a limited moon-shaped defect in the base of the bulbus is observed, with concavity open towards the pylorus (Fig. 1) and medially located. In further protrusion of one or more folds into the bulbus, a shift is noted to the left or right towards one of the recesses — thus the unilateral prolapse results (Fig. 2 ab). In protrusion of a greater number of folds through the pylorus, they usually occupy a central disposition at the base of the bulbus under the form of arched impressions, with the arches open towards the base of the bulbus — total, circular prolapse (Fig. 3 a, b). This is in fact, the form referred to by some authors as an umbrella, mushroom or parachute.
The finding of tiny, archiform impressions (mono- or multi-arched) situated in the medial portion of the bulbus base — towards the aperture of the pylorus — conditioned by the gastric folds' protrusion into the bulbus is usually considered as initial symptom of the prolapse (Fig. 4 a, b).

Depending on the degree of protrusion of the folds, the defect may fill out merely part of the bulbus base or its proximal half, reaching in some cases up to the summit part, as was the case in two of our patients (Fig. 4 c, d). In many instances the prolapse occurs spontaneously, but it might be easily promoted by the application of dosed compression on the prepyloric part of the stomach. Examination is effected both in erect and recumbent position of the patient. At the slightest suspicion for prolapse, serial roentgenograms are mandatory, particularly in the ist oblique position — for obviating projectional misleading images, due to the orthogradely found pylorus, resp. the base of the bulbus.

Figures 4 a, b, c, d illustrate very clearly the gradual penetration of mucous folds into the bulbus duodeni, in which initially a bi-arched defect is noted at the base of the bulbus (Fig. 4 a), and in the following moment subsequent to peristaltic contraction of the antrum (Fig. 4 b) — the triarched shape is outlined, resembling a clover leaf. In the following two, serially performed
Gradual penetration of gastric loops into the bulbus duodeni in a 46-year-old male patient. Manifested in a bi-arched pattern slight impressions in the bulbus base (a); following intense peristalsis a tri-arched defect is produced with shape of clover-leaf (b); after further 5 minutes a defect is created in the bulbus, reaching from the pylorus to the top part of the bulbus (c, d).
roentgenograms of the same patient (Fig. 4 c,d), a defect is observed similar to strip, medially located throughout the full length of the bulbus, up to its top part; laterally, it is surrounded by contrast matter. In the latter patient, regardless of palpation applied, the thrust in folds were retained for quite a long time in the bulbus, thereby spontaneously passing into the antrum.

In agreement with Zimmer (34), we also lay emphasis on the "increased distance between the base of the bulbus and the antrum", considering it furthermore as characteristic. In most of the cases a pronounced tubular stretching of the prepyloric part of the stomach was observed in the separate phases of the investigation, conditioned by circular spasm (Fig. 1, 2 b and 3 a, b). The latter reflexively conditioned tubular spasm is assumed as an indirect sign for prolapse of gastro-mucous folds into the duodenum. Usually, the protrusion of the folds takes place in a moment of strongest peristaltic transition, whereas their backward route is dependent upon the degree of pylorospasm, following a shorter or longer interval of time.

Out of a total of 32 personal observations of prolapse, we found a rather prolonged retention of invaginated gastric folds into the bulbus merely in three patients. Two of them complained of persistent colic pains, associated to nausea. Most of patients of our series had normotonic stomachs. Intensified gastric peristalsis was noted in 21 patients, delayed — in 5 and within normal limits — in 6. Clinico-roentgenological evidence for chronic gastro-
duodenitis were established in 8 of the patients. Presence of prolapse in combination with duodenal ulcer was observed merely in two.

Insofar differential diagnosis is concerned of gastric mucosa prolapse, the listed below conditions should be also considered: protruded into the duodenum gastric polyps, duodenal polyposis, pyloric hypertrophy, duodenitis etc.

The more rounded shape with smooth and clear-cut outlines, as well as constancy in form and size are rather more characteristic for the protrusion of the polyp into the bulb. In some instances a single bright strip is visible in the pyloric canal, corresponding to the protruded "pedicle" of the polyp, whereas in prolapse, 2—3 small bands of translucency in the pylor are usually detected.

The polyps originating from the mucosa of the bulb, have likewise smooth and clear-cut outlines and a constancy in shape, size and locality, but display no connections whatsoever with the folds of the antrum.

The finding of a strictly symmetrical, pronounced, bi-arched impression at the base of the bulbus is characteristic for pyloric hypertrophy — laterally to the pylorus, caused by the pressure exerted by the thickened pyloric musculature, accounting for a constant defect at the base of the bulbus, contrary to the variable appearance of mucosal prolapse into the bulb duoden.

In duodenitis, the thickened folds of the mucosa might likewise resemble the protruded gastric folds, but usually these changes are spread throughout the entire bulbus, and moreover, rather frequently similar changes are marked in the remainder part of the duodenum as well, without any connections being established between the thickened folds in the bulbus and those of the prepyloric part of the stomach.

The image of the orthogradely encountered pylorus, respectively the base of the bulbus should not be misinterpreted as a prolapse, for in obese subjects or in more obliquely situated bulbus duodeni they are visible as ovalshaped, with radially located folds, similar to wheel spokes (Fig. 5 a, b), in particular during examination in II oblique position, following application of compresion.

In conclusion, we should emphasize that the prolapse of the gastric mucosa into the duodenal bulbus bears a characteristic X-ray symptomatology, and being familiar with the latter might guard the roentgenologist of committing gross diagnostical errors, and the clinicist — from application of futile symptomatic therapy.

REFERENCES

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ПО ПОВОДУ РЕНТГЕНОВСКОЙ ДИАГНОСТИКИ ВЫПАДЕНИЯ СЛИЗИСТОЙ ЖЕЛУДКА И ЛУКОВИЦУ ДВЕНАДЦАТИПЕРСТНОЙ КИШКИ

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РЕЗЮМЕ

После кратких данных о этиопатогенезе, частоте и клинической картине пролапса слизистой желудка в луковицу двенадцатиперстной кишki, автор рассматривает рентгеновскую симптоматологию, указывая на чаще всего встречающиеся формы — выпадение отдельной складки слизистой, унilaterальный пролапс, циркулярный пролапс и др.

Автор подчеркивает, что диагноз выпадения слизистой желудка не труден, если знать особенности рентгеновского образа "дефекта", получающего в результате выпадения складок слизистой желудка — изменения формы, величины, местоположения и пр. Наблюдаемый при пролапсе дефект в заполнении луковицы, описываемый в литературе в виде "зонта", "гриба", "парашюта" и др., автор причисляет к прогрессировавшим формам пролапса слизистой желудка. Как начальный симптом он принимает наличием маленьких дуговидных импрессий, расположенных в средней части основания луковицы с вогнутостью по направлению выхода привратника. В виде косвенного признака о появлении пролапса, он указывает на апериодическое появление трубкообразного препилярического спазма, обусловленного рефлекторно проникающими через привратник желудочными складками.
Автор наблюдал 32 больных с выпадением слизистой желудка в луковицу двенадцатиперстной кишки (18 мужчин и 14 женщин), иллюстрируя, при помощи их, начальные и прогрессировавшие формы выпадения.

В конце статьи, автор проводит дифференциальный диагноз с заболеваниями, которые напоминают "дефект", образующийся в бульбусе пролабировавшими в него складками желудка. Указывается на обманный образ и в результате ортоградно встреченного привратника, соотв. основания луковицы, принимающих форму овала с радиально расположенными складками в виде спиц колеса, которую фигуру часто ошибочно толкуют как пролапс.

В заключение автор подчеркивает, что выпадение слизистой желудка в двенадцатиперстную кишку имеет характерную рентгенологическую симптоматику, знание которой может избавить рентгенолога от грубых диагностических ошибок, а клинициста — от применения лишней симптоматической терапии.