



DIFFERENTIAL DIAGNOSIS OF AGE-RELATED NORMAL AND PATHOLOGICAL SIGNS IN STOMACH RADIOGRAPHY

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ABSTRACT: *This article analyzes the age-dependent normal and pathological radiographic features of the stomach and provides a systematic approach to differential diagnosis. Normal anatomical variations in infants, children, adolescents, adults, and the elderly are compared with characteristic radiographic signs of common gastric disorders, including gastritis, peptic ulcer disease, gastroesophageal reflux, functional dysmotility, and gastric neoplasms. Age-specific radiographic markers such as stomach configuration, mucosal fold patterns, peristaltic activity, gastric tone, and contrast evacuation times are reviewed. A diagnostic framework is proposed to distinguish physiological age-related changes from true pathology. The findings contribute to improving diagnostic accuracy in radiology and gastroenterology, preventing misinterpretation, and guiding clinical decision-making.*

KEYWORDS: *Gastric radiography, age-related changes, differential diagnosis, mucosal folds, gastric tone, peristalsis, functional disorders, gastric pathology, pediatric radiology, geriatric radiology.*

MAIN BODY

1. Introduction

Radiographic assessment of the stomach is an important diagnostic tool in gastroenterology. However, accurate interpretation requires recognition of normal age-related anatomical and physiological variations. Failure to distinguish these from pathological signs may lead to overdiagnosis in children or underdiagnosis in the elderly.

Age influences stomach shape, tone, mucosal architecture, motility, and the dynamics of contrast passage, all of which affect radiographic appearance. This

article reviews these normal developmental changes and contrasts them with signs of gastric disease to establish a reliable differential diagnostic method.

2. Normal age-related radiographic features of the stomach

2.1. Infants (0–1 year)

- **Configuration:** predominantly horizontal stomach.
- **Capacity:** very small (30–80 ml).
- **Tone:** weak gastric tone; frequent physiological reflux.
- **Peristalsis:** irregular, weak but frequent waves.
- **Mucosal folds:** smooth, thick, poorly defined.

Advantages for diagnosis: physiological reflux must not be mistaken for GERD; delayed emptying may be functional, not pathological.

2.2. Children (2–12 years)

- **Configuration:** gradually transitions to oblique (mesomorphic) type.
- **Tone:** stronger than infants; stable gastric sphincter function.
- **Mucosal folds:** more pronounced and regular.
- **Motility:** rhythmic, moderately fast; contrast passes quickly.

Diagnostic relevance: hypermotility may mimic gastritis; mild reflux still possible without pathology.

2.3. Adolescents and Adults (13–50 years)

- **Configuration:** normal variations—vertical, diagonal, or horizontal types depending on body habitus.
- **Tone:** optimal, strong gastric wall tone.
- **Peristalsis:** regular, strong rhythmic contractions.
- **Mucosal folds:** distinctly visible; thick in the corpus, ring-like in the antrum.

Radiographic importance: the most reliable stage for correlating radiographic abnormalities with clinical symptoms.

2.4. Elderly (50+ years)

- **Configuration:** elongated, vertical (“gastroptosis”) due to muscular atrophy.



- **Tone:** reduced; gastric wall relaxation.
- **Motility:** delayed gastric emptying; weak peristalsis.
- **Mucosal folds:** flattened due to atrophy; indistinct or absent rugae.

Clinical relevance: age-related atrophy may mimic chronic atrophic gastritis; delayed evacuation must be interpreted cautiously.

3. Pathological radiographic signs and their differentiation from age-related features

3.1. Gastroesophageal reflux (GERD)

Pathological signs:

- significant retrograde contrast flow into the esophagus;
- dilated distal esophagus;
- incompetent cardiac sphincter.

Differential points:

- **Infants:** mild reflux is physiological; persistent reflux with aspiration risk suggests pathology.
- **Adults/Elderly:** reflux usually indicates GERD or hiatal hernia—age is a key determining factor.

3.2. Gastritis (acute and chronic)

Pathological signs:

- loss of mucosal fold pattern;
- uneven contrast coating;
- spasm of the antrum;
- thickened or rigid mucosal folds (hypertrophic gastritis).

Differentiation:

- **Elderly:** folds disappear due to age-related atrophy → avoid misdiagnosis as chronic atrophic gastritis unless clinically correlated.
- **Children:** functional dysmotility may mimic mucosal irregularity, but folds are preserved.

3.3. Peptic ulcer disease

Radiographic markers:



- “niche sign” — contrast-filled ulcer crater;
- wall deformity;
- local loss of peristalsis;
- pyloric narrowing from scar formation.

Differential aspect:

- uncommon in infants and children—if seen, consider systemic disease.
- in elderly, deformities may result from chronic fibrosis, not active ulceration.

3.4. Gastric polyps

Signs:

- rounded filling defect;
- smooth margins;
- non-movable contour.

Differentiation:

- rare in young individuals—any polypoid lesion in children should raise suspicion of syndromic pathology.
- common after 40 years—distinguish from early neoplasia by assessing wall rigidity.

3.5. Gastric neoplasms

Radiographic signs:

- irregular, large filling defects;
- mucosal destruction;
- rigid wall segments;
- absence of peristalsis.

Age-related differential logic:

- almost never physiological in elderly; high suspicion required.
- in young adults, consider lymphoma rather than adenocarcinoma.

4. Differential diagnostic framework: age-specific approach

4.1. Infants

- Reflux + normal tone → physiological.



- Delayed contrast passage + pyloric narrowing → pyloric stenosis.
- Weak peristalsis alone → functional immaturity, not pathology.

4.2. Children

- Irregular contrast + preserved folds → functional gastritis.
- Fast transit → hypermotility, not ulcer.
- True ulcers are rare — seek underlying cause.

4.3. Adults

- Clear “niche” + spasm → peptic ulcer.
- Persistent reflux → GERD.
- Deformity of the antrum → chronic ulcer scarring.

4.4. Elderly

- Loss of folds → could be normal aging or atrophic gastritis: confirm with clinical tests.
- Severe delay in emptying → evaluate motility disorders vs. neoplasm.
- Large filling defect → consider malignancy first.

CONCLUSION

Understanding age-related radiographic variations of the stomach is essential for accurate differential diagnosis. Normal developmental features in infants, functional patterns in children, stable adult anatomy, and involutional changes in the elderly significantly affect radiographic interpretation. Distinguishing physiological changes from pathological findings prevents misdiagnosis, reduces unnecessary interventions, and improves clinical accuracy. Age-oriented diagnostic guidelines enhance the effectiveness of radiographic evaluation and support better decision-making in gastroenterology and radiology.

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