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Original Research Article

Accessory Spleen: A Rare Finding – A Cadaveric Retrospective Study in Western Odisha

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Abstract:

Background: Accessory spleens are congenital nodules of splenic tissue that arise from incomplete fusion of splenic mesenchymal buds during embryogenesis. Although often clinically silent, their presence is important for surgeons and radiologists because they may mimic abdominal masses or lead to persistent symptoms after splenectomy. Evidence from cadaveric studies in Odisha remains limited.

Objective: To determine the prevalence, number, anatomical distribution, and morphological characteristics of accessory spleens identified during routine cadaveric dissections at SRM Medical College and Hospital, Bhawanipatna medical college in Western Odisha.

Methods: A retrospective analysis was conducted on adult cadavers dissected over six months in the Department of Anatomy, SRM Medical College and Hospital, Bhawanipatna. Documentation from routine abdominal dissections was reviewed. For each cadaver, observations regarding the presence of accessory spleens, their number, precise location, size, and gross morphology were collected from departmental records. Data were analyzed using descriptive statistics.

Results: Among 60 adult cadavers (40 males and 20 females) examined, accessory spleens were observed in 6 cases, representing a prevalence of 10%. A total of eight accessory spleens were recorded. The splenic hilum was the most frequent location (62.5%), followed by the tail of the pancreas (25%) and the gastrosplenic ligament (12.5%). All accessory spleens were rounded to ovoid, well-encapsulated, and similar in appearance to the main spleen. Their size ranged from 0.7 to 2.1 cm, with an average diameter of 1.3 ± 0.4 cm.

Conclusion: The study demonstrates that accessory spleens were present in 10% of cadavers examined, with the splenic hilum being the predominant site. Awareness of such variants is essential in abdominal surgery, trauma care, and radiological interpretation, as failure to identify accessory splenic tissue may lead to diagnostic errors or incomplete splenectomy.

Keywords: Accessory Spleen, Cadaveric Anatomy, Splenic Variation, Splenic Hilum, Anatomical Study, Odisha.

Introduction

The spleen is an important organ involved in filtration of blood, immune surveillance, and hematological regulation. It develops from mesenchymal condensations in the dorsal mesogastrium during early embryonic life. These small buds normally unite to form a single organ, but when fusion is incomplete, separate nodules of splenic tissue may remain. These nodules, known as accessory spleens, are usually small and resemble the main spleen in structure and vascular pattern. They are most often found near the splenic hilum but can also occur along the gastrosplenic ligament, splenorenal ligament, or close to the tail of the pancreas. Their presence reflects natural variations in splenic development and serves as an important anatomical consideration [1,2].

Accessory spleens hold significant clinical relevance, especially in patients undergoing splenectomy for hematological disorders. If these additional splenic tissues are not identified and removed when required, they may continue to perform splenic functions and result in persistent or recurrent symptoms. For this reason, surgeons must be familiar with the typical locations where accessory spleens are likely to be present. Radiologists also encounter these structures on imaging, and differentiating them from pancreatic lesions, lymph nodes, or other soft-tissue masses is essential to avoid misinterpretation [3,4].

In trauma and postoperative settings, accessory spleens may assume greater functional importance. After splenic removal or injury, they can enlarge and serve as the primary residual splenic tissue.

Although uncommon, complications such as torsion, infarction, or spontaneous hemorrhage in accessory spleens have been documented and may present as acute abdominal pain. Cadaveric dissections offer a direct opportunity to observe these structures in their natural anatomical relationships, providing insights that complement radiological findings and enhance understanding of splenic variations [5,6].

Despite the well-recognized significance of accessory spleens, information from the region of Western Odisha is limited. Anatomical variations can differ across populations, making regional studies valuable for both clinical and academic purposes. The present work from SRM Medical College and Hospital, Bhawanipatna, was undertaken to document the prevalence, location, and morphological features of accessory spleens identified during routine cadaveric dissections. By reviewing systematically recorded observations over a defined period, this study contributes locally relevant data that may assist anatomists, surgeons, and radiologists in anticipating splenic variations in their practice [7,8].

Materials and Methods

Study Design and Setting: This retrospective cadaveric study was conducted in the Department of Anatomy, SRM Medical College and Hospital, Bhawanipatna, Kalahandi, Odisha. The study covered a six-month period during which routine academic dissections of adult cadavers were performed for undergraduate teaching.

Study Population: All adult cadavers dissected during the study period were reviewed. Only those with intact upper abdominal organs and complete documentation of splenic dissection were included.

Inclusion Criteria:

1. Adult cadavers (age ≥18 years as per available records) subjected to complete abdominal dissection.
2. Cadavers in which the spleen, splenic hilum, peritoneal ligaments, and surrounding structures were clearly identifiable.

Exclusion Criteria:

1. Cadavers showing evidence of previous splenic surgery or major upper abdominal operative scars.
2. Cadavers with traumatic distortion of the left upper quadrant or decomposition preventing adequate assessment.
3. Incomplete documentation of splenic findings.

Data Collection Procedure: During routine dissection, the spleen and its peritoneal attachments were exposed following the standard anatomical approach. The splenic hilum, gastrosplenic ligament, splenorenal ligament, tail of the pancreas, and adjacent peritoneal folds were systematically inspected for accessory splenic tissue. All observations were recorded in the departmental dissection register by faculty or senior demonstrators at the time of dissection.

For the present study, the documented records were reviewed. The following parameters were extracted:

- Presence or absence of accessory spleen(s)
- Number of accessory spleens
- Anatomical location
- Shape, surface characteristics, and capsular definition
- Maximum diameter (measured in centimeters during dissection using a Vernier caliper or measuring scale)
- Relation to splenic vessels or adjacent structures, if documented

Sample Size: A total of 60 cadavers met the inclusion criteria and were included in the analysis.

Quality Control and Verification: Entries from the dissection register were cross-checked with available photographs and notes maintained in the department to ensure consistency. When discrepancies appeared, the original hard-copy records made during dissection were referred to.

Data Management and Statistical Analysis: All extracted data were entered into Microsoft Excel. Analysis was descriptive in nature. Categorical variables such as prevalence, number, and location of accessory spleens were expressed as frequencies and percentages. Continuous variables such as size were presented as mean ± standard deviation and range. No inferential testing was performed due to the descriptive aim of the study.

Ethical Considerations: Permission for accessing cadaveric dissection records was obtained from the Head of the Department. As the study involved documented anatomical findings from donated cadavers with no identifiable personal information, formal ethics committee approval was waived as per institutional guidelines.

Results

A total of 60 adult cadavers were included in the analysis, consisting of 40 males and 20 females, as documented in departmental records. All cadavers had intact upper abdominal structures allowing complete evaluation of the spleen and its surrounding ligaments. Accessory spleens were identified in 6 cadavers, giving an overall prevalence of 10%. No cadaver had more than two accessory spleens.

Among the 6 positive cadavers, a total of 8 accessory spleens were documented. The majority of these were located near the splenic hilum, followed by the tail of the pancreas and the gastrosplenic ligament.

All accessory spleens displayed a rounded to ovoid appearance and were enclosed in a well-defined capsule similar in texture and color to the main spleen. Their size ranged from 0.7 cm to 2.1 cm, with an average diameter of 1.3 cm.

The splenic hilum was the most frequent site, accounting for nearly two-thirds of all accessory spleens identified. The peripancreatic region, particularly the tail of the pancreas, contributed to one-fourth of the findings. Only a single accessory spleen was found in the gastrosplenic ligament. No accessory spleen was observed in atypical locations such as the greater omentum or mesentery.

Table 1: Distribution of Accessory Spleens by Location (n = 8)

Location	Number	Percentage (%)
Splenic hilum	5	62.5%
Tail of pancreas	2	25.0%
Gastrosplenic ligament	1	12.5%
Other sites	0	0%

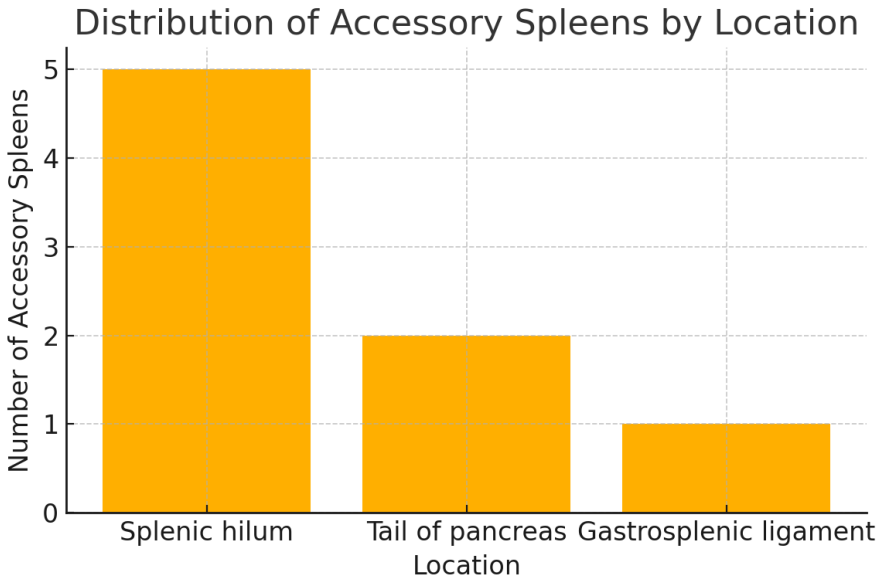

Figure 1: Distribution of Accessory Spleens by Location

Discussion

The present study highlights the occurrence and distribution of accessory spleens in a series of adult cadavers examined in Western Odisha. The 10% prevalence observed here corresponds well with reports from other anatomical studies across India and abroad, suggesting that these splenic nodules are a consistent anatomical variation across populations. While the overall frequency falls at the lower end of the commonly cited range, it still demonstrates that accessory spleens are not rare incidental findings but rather structures encountered with enough regularity to merit routine attention during dissections and clinical examinations [9,10].

A notable observation in this study was the predominance of accessory spleens at the splenic hilum. Comparable findings have been documented in anatomical studies from Tamil Nadu, Karnataka, and northern India, reinforcing the notion that this region is the most predictable location for accessory splenic tissue. The consistency of this pattern across various populations underscores the need for focused inspection of the hilum during procedures such as splenectomy or vascular ligation in the left upper quadrant. The anatomical proximity to the main spleen also raises the possibility that small nodules in this region may be overlooked unless specifically sought [11,12].

The peripancreatic location, particularly the tail of the pancreas, was the second most frequent site identified in this series. This finding is important because accessory spleens in this region often appear on imaging studies and are sometimes mistaken for pathological lesions of the pancreas. Numerous radiological reports have highlighted this diagnostic challenge, and the present study adds cadaveric evidence supporting the frequency of this variant in the pancreatic tail region. Given the rising use of cross-sectional imaging for abdominal evaluation, familiarity with this anatomical pattern becomes increasingly relevant [13,14].

The single accessory spleen identified in the gastrosplenic ligament reflects a pattern occasionally reported in cadaveric and surgical literature. While not a dominant site, this ligament is encountered during upper gastrointestinal surgeries, including operations on the stomach and proximal greater curvature. The presence of accessory spleens in this area may carry procedural significance, especially when planning lymphadenectomy or mobilizing the stomach. Even though such findings are less frequent, their potential influence on operative field interpretation justifies their inclusion in surgical awareness [15,16].

All accessory spleens documented in this study were relatively small, a pattern consistent with those noted in most autopsy and cadaveric series. Although size does not necessarily correlate with clinical relevance, smaller nodules may be more easily missed during dissection or surgery. The uniformity in appearance within this study also suggests an absence of pathological enlargement, reinforcing the likelihood that these were incidental developmental remnants rather than the result of compensatory processes or disease. This consistency provides a baseline reference for anatomists and surgeons working in this region [17].

The findings also carry relevance for contemporary surgical and diagnostic practice. Incomplete resolution of hematological disorders after splenectomy is frequently attributed to unrecognized accessory splenic tissue. By identifying the frequency and typical distribution of these nodules in a local population, the present study contributes practical information that can assist surgeons in reducing the risk of residual functional splenic tissue following operative procedures. Similarly, radiologists interpreting abdominal imaging in postoperative or trauma settings may benefit from the anatomic correlations provided here, especially when evaluating enhancing nodules in typical splenic regions [18].

While the study enriches regional anatomical data, certain limitations must be considered. The retrospective nature relied fully on previously recorded observations, which may have caused the smallest nodules to go unreported. The study period and sample size, although adequate for descriptive analysis, do not capture the full spectrum of variation that might be seen in a larger or more diverse cohort. Nevertheless, the findings expand the anatomical knowledge base for Western Odisha and complement existing literature from other parts of India. They also emphasize the importance of detailed inspection during dissection and the value of region-specific anatomical documentation.

Conclusion

In this cadaveric study at SRM Medical College and Hospital, Bhawanipatna, accessory spleens were identified in 10% of examined cadavers, with the splenic hilum representing the most frequent location, followed by the tail of the pancreas and the gastrosplenic ligament. These findings underscore the importance of recognizing common anatomical sites where accessory splenic tissue may be encountered. Although typically asymptomatic, accessory spleens can influence clinical outcomes, particularly in settings where complete splenic removal is necessary or when interpreting imaging studies of the upper abdomen. The results of this study provide region-specific anatomical data that may support surgical planning, radiologic interpretation, and academic instruction. Continued documentation of splenic variations across diverse populations is essential to improving anatomical understanding and minimizing diagnostic or operative oversights.

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