

An Overview on the Complexity of Lymph Node Metastasis in Early Gastric Cancer

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ABOUT THE STUDY

Lymph node metastasis in Early Gastric Cancer (EGC) presents an important challenge in the management and treatment of this disease. Understanding the complexities of lymphatic spread and its effects in the early-stage gastric cancer is fundamental for guiding treatment decisions and improving patient outcomes. Lymph node metastasis is important to determine the diagnosis and treatment planning in gastric cancer. Early gastric cancer, defined as tumors limited to the mucosa or submucosa, the presence or absence of lymph node metastasis considerably influences patient outcomes. The risk of lymph node involvement varies depending on tumor characteristics, including size, depth of attack, and histological features.

Risk factors

Lymph node metastasis in EGC is a key factor influencing treatment decisions and diagnosis. Several risk factors are associated with an increased chance of lymph node metastasis in EGC. It's important to note that these risk factors may vary slightly based on the specific characteristics of the tumor and patient population. Here are some commonly recognized risk factors:

Depth of invasion (tumor stage): Generally, as the tumor penetrates deeper into the gastric wall, the risk of lymph node metastasis increases. T1a and T1b tumors are less likely to metastasize compared to T2 and higher stages.

Histological type: Certain histological types of gastric cancer have a higher chances for lymph node metastasis. For example, poorly differentiated or signet ring cell carcinoma may exhibit a higher risk.

Lymphovascular Invasion (LVI): Presence of lymphovascular invasion indicates that cancer cells have entered lymphatic or blood vessels, increasing the chance of spreading to regional lymph nodes.

Location of the tumor: The location of the tumor within the stomach can impact the chances of lymph node metastasis. For example, tumors located in the proximal stomach may have a higher risk.

Depth of submucosal invasion: For early gastric cancers that attack the submucosa, the depth of submucosal invasion is a crucial factor. Deeper submucosal invasion is associated with an increased risk of lymph node metastasis.

Tumor differentiation: Well-differentiated tumors may have a lower risk of lymph node metastasis compared to poorly differentiated or undifferentiated tumors.

Perineural invasion: Cancer cells entering into nerves surrounding the tumor may increase the risk of lymph node metastasis.

Endoscopic findings: Certain endoscopic features, such as ulceration and irregular or nodular surface patterns, may be associated with an increased risk of lymph node metastasis.

Diagnosing of lymph node metastasis

Accurate preoperative diagnosis and assessment of lymph node involvement are important for treatment planning in EGC:

Imaging techniques: Methods like Endoscopic Ultrasound (EUS), CT scans, MRI, and PET scans are used to determine the size of the primary tumor and detect potential lymph node metastases. However, their sensitivity in detecting microscopic metastasis remains limited.

Endoscopic techniques: Endoscopic Submucosal Dissection (ESD) allows for detailed examination and accurate removal of early-stage tumors, facilitating a more accurate assessment of depth of attack and the risk of lymph node involvement.

Sentinel lymph node biopsy: In certain cases, sentinel lymph node biopsy is used to identify the first lymph nodes that remove a specific tumor site. This technique helps in assessing the chance of lymphatic spread.

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Treatment methods

The presence or absence of lymph node metastasis considerably influences treatment decisions in EGC:

Surgical management: Traditionally, radical gastrectomy with lymphadenectomy has been the standard surgical approach for EGC. The extent of lymphadenectomy depends on the risk of lymph node metastasis based on tumor characteristics.

Endoscopic resection: For select cases of EGC without high-risk features for lymph node metastasis, endoscopic resection may be considered as a minimally invasive treatment option. However, careful patient selection and thorough preoperative assessment are fundamental.

Adjuvant therapy: In cases where lymph node metastasis is identified post-surgery, or in high-risk EGC, adjuvant chemotherapy or chemo radiotherapy may be recommended to reduce the risk of recurrence.

Research and future directions

Advancements in diagnostic technologies and treatment strategies are continually being explored to address the challenges associated with lymph node metastasis in EGC:

Molecular and genetic markers: Research into molecular and genetic markers aims to identify specific biomarkers that expect

the risk of lymph node metastasis, supporting in more specific risk stratification.

Improved imaging modalities: Ongoing research focuses on improving imaging techniques, such as better endoscopic imaging and molecular imaging, to improve the detection of micro-metastases in lymph nodes.

Personalized treatment strategies: Advancements in precision medicine and targeted therapies offer potential avenues for more personalized treatment strategies based on individual tumor characteristics and genetic profiles.

CONCLUSION

Lymph node metastasis in early gastric cancer is an important determinant of diagnosis and treatment strategy. Factors such as tumor depth, histological type, lympho-vascular invasion, and tumor size significantly influence the risk of lymph node involvement. Early detection and accurate assessment of these risk factors are key for informed treatment decisions. Surgical interventions, including lymphadenectomy, are often guided by the extent of lymph node metastasis risk. As research advances, molecular profiling may improve our ability to predict and manage lymphatic spread in a more personalized manner, featuring the importance of a multidisciplinary approach in the management of early gastric cancer.