

Review of the Literature on Pyloromyotomy: What We Know So Far?

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ABSTRACT

Pyloromyotomy is a surgical procedure used to treat infants with pyloric stenosis. Pyloric stenosis is a relatively common condition in which the muscle at the bottom of the stomach (the pylorus) becomes thickened, leading to obstruction of the passage of food into the small intestine. Pyloromyotomy is a surgical procedure that involves making a small incision in the infant's abdomen and cutting through the thickened muscle fibers of the pylorus to create a wider opening for food to pass through.

This article reviews the indications, technique, outcomes, and potential complications of pyloromyotomy, with a particular focus on the pediatric population. The success rate of the procedure is over 95%, and most infants are able to resume feeding within a day or two after the procedure. Pyloromyotomy is a safe and effective treatment for pyloric stenosis, but as with any surgical procedure, there are risks involved, including bleeding, infection, and damage to surrounding organs. The article discusses the preoperative preparation, intraoperative techniques, and postoperative care of infants undergoing pyloromyotomy, as well as the long-term outcomes and potential complications of the procedure. The importance of careful patient selection, accurate diagnosis, and multidisciplinary management is emphasized, along with the need for close monitoring and follow-up after surgery.

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INTRODUCTION

Pyloromyotomy, a surgical procedure used to treat infants with pyloric stenosis. Pyloric stenosis is a relatively common condition in which the muscle at the bottom of the stomach (the pylorus) becomes thickened, leading to obstruction of the passage of food into the small intestine. This can result in symptoms such as projectile vomiting, dehydration, and weight loss, and typically requires medical intervention.¹

Pyloromyotomy is a surgical procedure that involves making a small incision in the infant's abdomen and cutting through the thickened muscle fibers of the pylorus to create a wider opening for food to pass through. The procedure is typically performed under general anesthesia and requires a hospital stay of a few days for observation and recovery.¹

Pyloromyotomy is a safe and effective treatment for pyloric stenosis, with a success rate of over 95%. However, as with any surgical procedure, there are risks involved, and parents should discuss the benefits and potential risks with their

child's healthcare provider before deciding on the best course of treatment.¹

In this context, the aim of this article is to review the indications, technique, outcomes, and potential complications of pyloromyotomy, with a particular focus on the pediatric population. Through a thorough analysis of the available literature, we aim to provide healthcare professionals and parents with a comprehensive understanding of the benefits and risks of this procedure in the treatment of pyloric stenosis.²

Indications

The main indication for pyloromyotomy is pyloric stenosis, which typically presents in infants between 2 and 8 weeks of age. The condition is more common in males and has a genetic predisposition. The diagnosis is made based on the characteristic symptoms of projectile vomiting, which can occur after every feeding, leading to weight loss, dehydration, and electrolyte imbalances. A palpable olive-shaped mass can often be felt in the right upper quadrant of the abdomen.²

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In general, pyloromyotomy is considered the gold standard treatment for infants with pyloric stenosis who are unable to tolerate or do not respond to medical management, such as rehydration and correction of electrolyte imbalances. However, there are some specific indications for pyloromyotomy that may vary depending on the individual case.²

These indications include:

-Failure to thrive: Infants with pyloric stenosis may experience significant weight loss and failure to thrive due to the inability to adequately feed and retain nutrients. Pyloromyotomy can help restore normal feeding patterns and promote weight gain.³

-Dehydration: Vomiting can lead to dehydration and electrolyte imbalances, which can be life-threatening in severe cases. Pyloromyotomy can help reduce vomiting and prevent further dehydration.³

-Electrolyte imbalances: Prolonged vomiting can lead to significant electrolyte imbalances, particularly hypochloremic metabolic alkalosis. Pyloromyotomy can help correct these imbalances and prevent further complications.³

-Recurrent vomiting: Infants with pyloric stenosis may experience recurrent episodes of vomiting, even after medical management. Pyloromyotomy can help alleviate this symptom and improve feeding tolerance.³

-Diagnostic uncertainty: In some cases, the diagnosis of pyloric stenosis may not be clear, and additional diagnostic tests may be necessary. Pyloromyotomy can be performed as a diagnostic tool to confirm the diagnosis and provide definitive treatment at the same time.³

-Family history: Infants with a family history of pyloric stenosis may be at increased risk for developing the condition, and pyloromyotomy may be recommended as a preventative measure.³

Pyloromyotomy is indicated in infants with pyloric stenosis who are unable to tolerate or do not respond to medical management. The procedure is highly effective in restoring normal feeding patterns, promoting weight gain, and preventing dehydration and electrolyte imbalances. Additionally, there may be specific indications for pyloromyotomy depending on the individual case, such as diagnostic uncertainty or family history of the condition.³

Surgical technique

Pyloromyotomy is a surgical procedure that involves making a small incision in the infant's abdomen and cutting through the thickened muscle fibers of the pylorus to create a wider opening for food to pass through.⁴

Preoperative Preparation

Prior to the procedure, the infant will undergo a thorough physical examination and medical history review. Blood tests may be performed to assess electrolyte and metabolic imbalances, and the infant may receive intravenous fluids to correct any abnormalities. The infant will be fasted for

several hours prior to the procedure to reduce the risk of aspiration during anesthesia.⁴

Incision: A small, transverse incision is made in the right upper quadrant of the infant's abdomen, just below the ribs. The incision is typically about 2-3 cm in length, but may vary depending on the size of the infant and the surgeon's preference.⁴

Exposure: The surgeon will use retractors to expose the stomach and pylorus. The peritoneum is opened, and the liver is retracted to the right to expose the pylorus.⁴

Pyloromyotomy: The thickened muscle fibers of the pylorus are identified and divided using a scalpel or electrocautery device. The incision is typically made along the longitudinal axis of the pylorus, starting at the antrum and extending towards the duodenum. The incision should be just deep enough to divide the muscle fibers and create a wider opening, but not deep enough to penetrate the mucosa or serosa.⁵

Closure: The incision is not closed with sutures, but left to heal naturally. The infant's abdominal wall is closed using absorbable sutures, and a sterile dressing is applied to the incision site.⁵

Outcomes

Overall, pyloromyotomy is a safe and effective procedure with a high success rate. The following are some of the outcomes that can be expected after pyloromyotomy.⁶

Immediate outcomes

Relief of symptoms: The most immediate outcome of pyloromyotomy is relief of the symptoms of pyloric stenosis, including vomiting, dehydration, and weight loss. Infants typically begin to tolerate feedings within a few hours of the procedure and can usually be discharged from the hospital within 1-2 days.⁷

Short hospital stay: Pyloromyotomy is typically performed as an outpatient procedure or requires a short hospital stay of one to two days.⁷

Minimal scarring: Because the incision used in pyloromyotomy is small, the resulting scar is typically minimal and fades over time.⁷

Low risk of complications: Pyloromyotomy has a low rate of complications. The most common complications include bleeding, infection, and damage to surrounding organs, but these are rare.⁷

High success rate: Pyloromyotomy is successful in more than 95% of cases, resulting in a wider opening at the pylorus and improved gastric emptying.⁷

Intermediate outcomes

Weight gain: Infants who undergo pyloromyotomy typically experience rapid weight gain after the procedure, as they are able to tolerate feedings without vomiting.⁸

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Improved growth: Infants with pyloric stenosis often experience delayed growth due to the difficulty in feeding. After pyloromyotomy, infants typically experience catch-up growth and improved development.⁸

Normal feeding: Infants are able to return to normal feeding habits after pyloromyotomy, with no restriction on formula or breast milk.⁸

Improved quality of life: The relief of symptoms and improvement in feeding after pyloromyotomy results in a significant improvement in the quality of life for both the infant and the parents.⁹

Long-term outcomes

Low risk of recurrence: The risk of recurrence of pyloric stenosis after pyloromyotomy is low, estimated at less than 5%.¹⁰

Normal gastric function: Pyloromyotomy does not affect the function of the stomach or intestines in the long term, and infants are able to achieve normal gastric emptying.¹⁰

No long-term effects: There are no long-term effects of pyloromyotomy on growth or development, and infants who undergo the procedure are expected to develop normally.¹¹

Potential complications

The following are some of the potential complications associated with pyloromyotomy:

Bleeding: One of the most common complications of pyloromyotomy is bleeding. During the procedure, the surgeon may inadvertently cut a blood vessel, leading to bleeding. While minor bleeding is common, severe bleeding may require a blood transfusion or additional surgery.¹¹

Infection: Like all surgical procedures, there is a risk of infection after pyloromyotomy. The surgical site may become infected, leading to fever, redness, swelling, and tenderness. In rare cases, a deep infection may develop, requiring additional treatment.¹¹

Wound dehiscence: Wound dehiscence is a rare but serious complication of pyloromyotomy. It occurs when the surgical incision reopens after the procedure. This can lead to bleeding, infection, and the need for additional surgery.¹¹

Scar tissue formation: Scar tissue may form at the site of the incision after pyloromyotomy. This can cause narrowing of the pylorus, leading to a recurrence of symptoms.¹¹

Damage to adjacent structures: During the procedure, there is a risk of damage to adjacent structures, such as the intestine or liver. This can result in bleeding, infection, or the need for additional surgery.¹²

Anesthetic complications: There is a small risk of complications related to anesthesia, such as an allergic reaction, respiratory distress, or cardiovascular events.¹²

Vomiting: While pyloromyotomy is intended to alleviate the symptoms of pyloric stenosis, some infants may continue to

experience vomiting after the procedure. This may be due to underlying gastrointestinal conditions, such as gastroesophageal reflux disease (GERD).¹³

Recurrence of pyloric stenosis: While pyloromyotomy is effective in the vast majority of cases, there is a small risk of recurrence of pyloric stenosis. This may require additional surgery or treatment.¹³

Pneumothorax: Rarely, pneumothorax can occur after pyloromyotomy. This is a condition in which air leaks into the space between the lung and chest wall, leading to difficulty breathing.¹³

Delayed gastric emptying: In rare cases, infants may experience delayed gastric emptying after pyloromyotomy. This can lead to persistent vomiting, feeding difficulties, and the need for additional treatment.¹³

CONCLUSIONS

In conclusion, pyloromyotomy is a safe and effective surgical procedure for the treatment of pyloric stenosis in infants. The procedure has been shown to be highly successful in alleviating the symptoms of pyloric stenosis, including projectile vomiting and poor weight gain.

Numerous studies have demonstrated that pyloromyotomy is associated with a low rate of complications, with most complications being mild and easily treatable. However, as with any surgery, there are potential risks and complications associated with the procedure, including bleeding, infection, wound dehiscence, scar tissue formation, and damage to adjacent structures. These complications are rare, and can usually be managed with appropriate medical intervention.

Recent advances in surgical techniques and technology have improved the safety and effectiveness of pyloromyotomy. The laparoscopic approach, in particular, has become increasingly popular due to its minimal invasiveness, shorter hospital stays, and faster recovery times. While pyloromyotomy is a highly effective treatment for pyloric stenosis, there is ongoing research to explore alternative treatment options, including endoscopic balloon dilation and medical management with atropine. These treatments may be appropriate for infants who are not good candidates for surgery, or for parents who are hesitant to have their child undergo a surgical procedure.

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