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СРАВНЕНИЕ РАЗЛИЧНЫХ СПОСОБОВ ГАСТРОСТОМИИ ПО ОБЪЕКТИВНЫМ КРИТЕРИЯМ

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РЕЗЮМЕ. Гастростомия является вынужденной операцией у больных, страдающих дисфагией. Пациенты не имеют возможности самостоятельно сравнить различные способы гастростомии, поэтому невозможно ориентироваться на их субъективную оценку. Для выбора способа гастростомии необходимы объективные критерии сравнения. Размеры площади стенки желудка, используемые при данном вмешательстве, влияют на объем и деформацию желудка, поэтому могут быть использованы как критерий сравнения. Цель статьи — сравнить различные способы гастростомии по объективным критериям. Для сравнения наиболее распространенных способов данного вмешательства проведен анализ техники выполнения операции. С помощью законов геометрии вычислены используемые для формирования свищей размеры стенки желудка без учета швов для гастропексии. При пункционной гастростомии площадь используемой стенки желудка соответствует площади внутренней прижимной пластинки (бампера). Для гастростомической трубки для чрескожной эндоскопической гастростомии 15 Fr с диаметром внутреннего бампера 2,3 см площадь используемой стенки желудка равна 4,2 см². При использовании для расчетов гастростомической трубки диаметром 1,0 см для гастростомии по Witzel необходимо около 31 см² стенки желудка, а для гастростомии по Stamm–Senn–Kader — 38,5 см² стенки желудка. Пункционные способы гастростомии являются оптимальными для пациентов, не требующих дополнительных вмешательств в брюшной полости. При невозможности пункционной гастростомии целесообразно использовать прижимную гастростомию через минилапаротомию, которая менее травматична, чем традиционные операции. Лапаротомные и лапароскопические гастростомии с формированием свища из стенки желудка показаны при необходимости дополнительных диагностических и лечебных вмешательств в брюшной полости. При этом целесообразнее применять гастростомии по Witzel или хоботкового типа (по Depage или другие), при которых используется передняя стенка желудка меньшей площади и происходит меньшая деформация желудка по сравнению с гастростомией по Stamm–Senn–Kader.

КЛЮЧЕВЫЕ СЛОВА: гастростомия; критерии сравнения; площадь стенки желудка; паллиативные больные.

COMPARISON OF DIFFERENT GASTROSTOMY METHODS ACCORDING TO OBJECTIVE CRITERIA

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SUMMARY. Gastrostomy is a forced operation in patients suffering from dysphagia. Patients do not have the opportunity to independently compare different methods of gastrostomy, so it is impossible to focus on their subjective assessment. Objective criteria for comparison are needed to select a gastrostomy technique. The dimensions of the stomach wall area used in gastrostomy affect the volume and deformation of the stomach, and therefore can be used as a comparison criterion. The aim of the article is to compare different methods of gastrostomy according to objective criteria. To compare the most common methods of gastrostomy, an analysis of the operation technique was carried out. Using the laws of geometry, the dimensions of the stomach wall used for the formation of fistulas were calculated without taking into account the sutures for gastropexy. With puncture gastrostomy, the area of the stomach wall used corresponds to the area of the internal pressure plate (bumper). For a 15 Fr percutaneous endoscopic gastrostomy tube with an internal bumper diameter of 2.3 cm, the area of the stomach wall used is 4.2 cm². When using a gastrostomy tube with a diameter of 1.0 cm for calculations, Witzel gastrostomy requires about 31 cm² of the stomach wall, and for Stamm–Senn–Kader gastrostomy — 38.5 cm² of the stomach wall. Puncture methods of gastrostomy are optimal for patients who do not require additional interventions in the abdominal cavity. If puncture gastrostomy is not possible, it is advisable to use pressure gastrostomy through minilaparotomy, which is less traumatic than traditional operations. Laparotomic and laparoscopic gastrostomies with the formation of a fistula from the stomach wall are indicated if additional diagnostic and therapeutic interventions in the abdominal cavity are necessary. In this case, it is more expedient to use gastrostomy according to Witzel or proboscis type (according to Depage or others), in which the anterior wall of the stomach of a smaller area is used and there is less deformation of the stomach compared to gastrostomy according to Stamm–Senn–Kader.

KEY WORDS: gastrostomy; comparison criteria; stomach wall area; palliative care.

BACKGROUND

Currently, a value-based approach is developing in healthcare. This approach is aimed at increasing the value of medical care for the patient, defined as the ratio of treatment outcomes to costs [6]. Gastrostomy is a forced operation in patients suffering from dysphagia. Patients do not have the opportunity to independently compare different methods of gastrostomy, so it is impossible to focus on their subjective assessment. Objective criteria for comparison are needed to select a gastrostomy technique. Taking into account the direct impact on the patient, the following objective criteria can be distinguished: the traumatism of access, the area of the stomach wall used to form a fistula, the cost of the operation, especially if the patient pays for the operation on his own. In the Russian Federation, most operations are financed by the Compulsory Medical Insurance system, so the economic aspects are not explored in this article. The dimensions of the area of the stomach wall used in gastrostomy affect the volume and deformation of the stomach [2], therefore, they can be used as a comparison criterion. The aim of the article is to compare different methods of gastrostomy according to objective criteria.

MATERIALS AND METHODS

To compare the most common methods of gastrostomy, an analysis of the operation technique was carried out. Using the laws of geometry, the dimensions of the stomach wall used for the formation of fistulas were calculated, without taking into account the sutures for gastropexy.

RESULTS

Currently, puncture methods of gastrostomy have received the greatest recognition [1]. The traditional methods of gastrostomy according to Witzel, Stamm–Senn–Kader and proboscis gastrostomy (according to Depage and others), which are performed through laparotomy or laparoscopically, remain relevant [3].

Puncture gastrostomies are applied using fibrogastroscopy, X-ray or ultrasound guidance [1]. The incision of the anterior abdominal wall corresponds to the diameter of the gastrostomy tube. Minimal invasiveness of access allows to reduce the duration and depth of anesthesia, which reduces the risk of complications.

Puncture gastrostomies are formed by pressing the stomach wall against the anterior abdominal wall with bumpers of gastrostomy tubes, which can be accompanied by gastropexy with anchor sutures [1]. In this case, a channel is not formed from the wall of the stomach, the deformation of the wall is minimal. The area of the circle is calculated by the formula $S=\pi r^2$, where S is the area of the circle, π is the Pi number, r is the radius of the inner pressure plate (bumper). If the 15 Fr puncture gastrostomy tube has an internal pressure plate (bumper) with a diameter of 2.3 cm, then the area of the usable stomach wall is 4.2 cm².

Traditional gastrostomies with the formation of a fistula from the stomach wall are performed through laparotomy or laparoscopic access. Laparotomy is the most traumatic approach, which requires appropriate anesthesia. During laparoscopic surgery, trauma to the anterior abdominal wall is less, but intra-abdominal pressure increases and anesthesia with muscle relaxation is required, which increases the risk of complications.

The following laparotomic gastrostomy methods are most commonly used: gastrostomy according to Witzel, gastrostomy according to Stamm–Senn–Kader and proboscis gastrostomy (according to Depage and others) [2].

In traditional gastrostomy, the fistula channel is most often formed from the stomach wall in two ways: the creation of a linear channel with interrupted sutures (Witzel gastrostomy, proboscis gastrostomy, and others) or the formation of a cone from the stomach wall with circular purse-string sutures (Stamm–Senn–Kader gastrostomy). Traditionally, gastrostomy tubes with a diameter of about 1 cm are used [5].

In the case of using the cone-shaped method of forming a gastrostomy according to Stamm-Senn-Kader [5] with a gastrostomy tube with a diameter of 1.0 cm, a section of the stomach wall about 7 cm in diameter is used. The area of the used stomach wall is calculated by the formula $S=\pi r^2$, where S is the area of the circle, π is the Pi number, r is the radius. Thus, in a Stamm-Senn-Kader gastrostomy, about 38.5 cm² of the anterior wall of the stomach is used.

According to the laws of geometry $P=2\pi r$, where P is the circumference, π is the Pi number, r is the radius. With a tube diameter of 1 cm, its circumference is about 3 cm. To create a channel around the tube, a section of the stomach wall with a width of at least 4 cm is required, with a channel length of 6 cm, an anterior stomach wall of 24 cm² is required. A purse-string suture at a distance of 1 cm around the area where the tube is inserted into the lumen of the stomach occupies 7 cm² of the wall. Thus, for a Witzel gastrostomy with a 1 cm tube, about 31 cm² of the stomach wall is needed.

DISCUSSION

The results obtained indicate that puncture methods of gastrostomy have the least trauma, which makes them the operation of choice.

In some cases, changes in anatomy do not allow the use of puncture techniques. For example, the lack of patency of the esophagus excludes the possibility of percutaneous puncture gastrostomy under the control of fibrogastroscopy. In some cases, revision of the abdominal cavity and simultaneous operations are necessary, which is impossible with the puncture technique. In addition, special disposable kits are required for puncture gastrostomy, which may not be available. Therefore, traditional methods of gastrostomy remain relevant [3].

When comparing traditional methods, the advantage of Witzel gastrostomy and proboscis gastrostomy was revealed, which require a smaller area of the anterior wall of the stomach, which leads to less deformation of the stomach and reduces the risk of functional disorders and complications (for example, gastroesophageal reflux).

If there is no need to expand access for additional manipulations in the abdominal cavity, it is possible to apply a gastrostomy through a minilaparotomic access. With pressure gastrostomy without forming a channel from the stomach through minilaparotomy, the area of the used stomach wall is similar to puncture techniques, and the invasiveness of the operation as a whole approaches the invasiveness of puncture gastrostomy [4].

CONCLUSION

Puncture methods of gastrostomy are optimal for patients who do not require additional interventions in the abdominal cavity.

If puncture gastrostomy is not possible, it is advisable to use pressure gastrostomy through minilaparotomy, which is less traumatic than traditional operations.

Laparotomic and laparoscopic gastrostomies with the formation of a fistula from the stomach wall are indicated if additional diagnostic and therapeutic interventions in the abdominal cavity are necessary. In this case, it is more expedient to use gastrostomy according to Witzel or proboscis type (according to Depage or others), in which the anterior wall of the stomach of a smaller area is used and there is less deformation of the stomach compared to gastrostomy according to Stamm–Senn–Kader.

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