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Schreiber et al.

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(54) **SURGICAL MARKER/CONNECTOR AND METHOD OF INSTALLATION**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 684 days.

This patent is subject to a terminal disclaimer.

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Related U.S. Application Data

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(51) **Int. Cl.**
A61B 17/08 (2006.01)
A61B 5/05 (2006.01)

(52) **U.S. Cl.** **606/153**; 606/155; 600/420

(58) **Field of Classification Search** ..... None
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,041,931	A *	8/1977	Elliott et al.	128/899
4,592,356	A	6/1986	Gutierrez et al.	
5,059,197	A	10/1991	Urie et al.	
5,158,084	A	10/1992	Ghiatas et al.	
5,197,482	A	3/1993	Rank et al.	
5,221,269	A	6/1993	Miller et al.	
5,409,004	A	4/1995	Sloan	
5,578,036	A	11/1996	Stone et al.	
5,709,697	A	1/1998	Rarcliff et al.	
5,989,265	A	11/1999	Bouquet De La Joliniere et al.	
6,356,782	B1	3/2002	Sirimanne et al.	
6,405,733	B1	6/2002	Fogarty et al.	
6,558,400	B2	5/2003	Deem et al.	
7,452,364	B2 *	11/2008	Schreiber et al.	606/153
2004/0002721	A1 *	1/2004	Podmore et al.	606/155
2004/0024386	A1	2/2004	Deem et al.	

OTHER PUBLICATIONS

Helmut Schreiber, M.D., Indukumar Sonpal, M.D. and Linda Patterson, M.D.—The Routine Use of a Gastropexy with a Radiologic Maker Without a Gastrostomy after Rouz-en-y Gastrix Bypass, Obesity Surgery 12, 2002.
The Cleveland Center for Bariatric Surgery (CCBS)—St. Vincent Charity Hospital—The CCBS Open Gastric Bypass, 2004.

(Continued)

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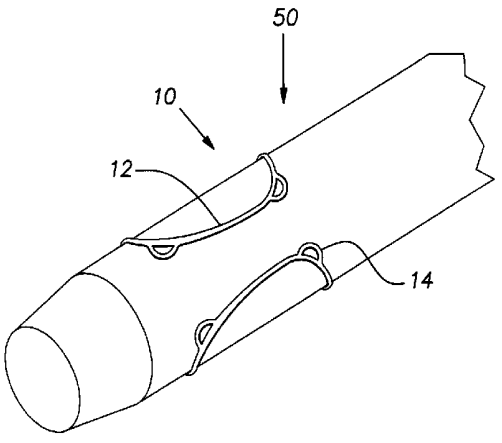
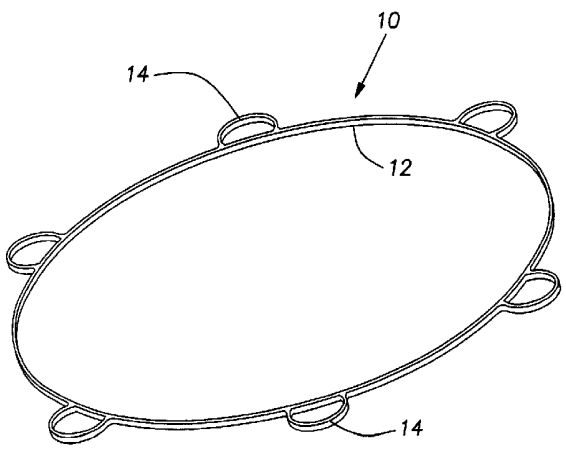
(57) **ABSTRACT**

A surgical marker/connector in the form of a ring made of a shape memory alloy such as NITINOL is suitable for laparoscopic installation in a patient's body. The ring preferably includes a plurality of small suture attachments in the form of loops that are disposed on the periphery of the ring and which lie in a plane that includes the ring itself. The loops are large enough to receive sutures which, in turn, can be used to connect the ring to a portion of a patient's body, or to connect separate portions of a patient's body to each other using the marker/connector as an intermediate connector. Prior to installation, the ring can be wrapped tightly about an elongate member such as a mandrel, which than can be inserted into the patient's body through a trochar or cannula. After insertion, the ring will change temperature and resume its original configuration where it can be sutured in place as desired.

15 Claims, 4 Drawing Sheets





OTHER PUBLICATIONS

Mathias A. L. Fobi, M.D., Kathleen Chicola, M.D. and Hoil Lee, M.D.—Access to the Bypassed Stomach After Gastric Bypass, Mar. 17, 1988.

Mathias A. L. Fobi, M.D. and Hoil Lee, M.D.—The Surgical Technique of the Fobi-Pouch Operation for Obesity (The Transected Silastic Vertical Gastric Bypass)—Obesity Surgery, 8, 1998.

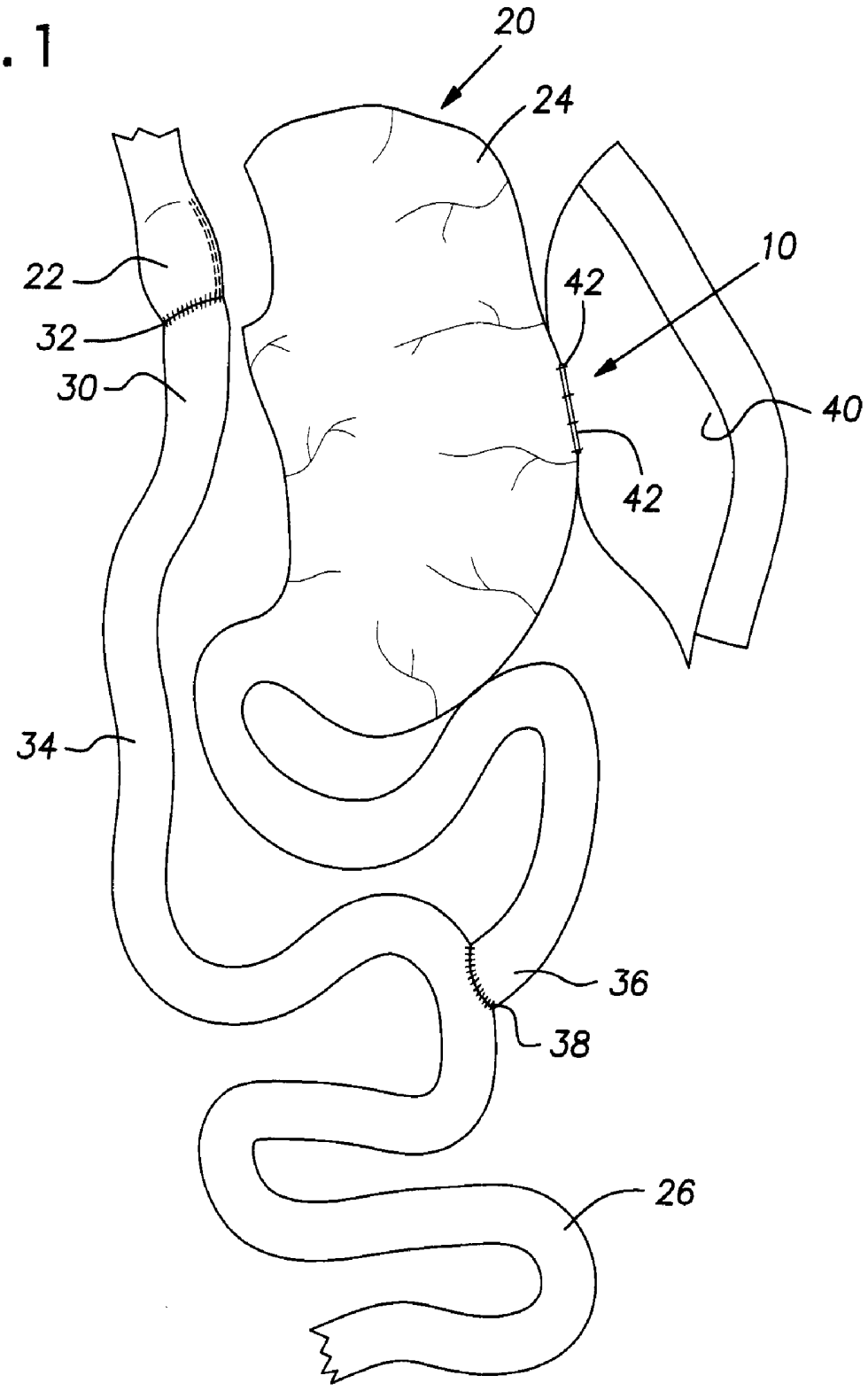
Johnson & Johnson Gateway—The Mammotome Breast Biopsy System, Internet advertisement, Jul. 2004.

Gi Supply—Gi Spot—www/gis-spot.com/index.html, Internet advertisement, Jul. 2004.

Baritec, Inc., GaBP Ring Autolock System, brochure, El Dorado Hills, California.

* cited by examiner

FIG. 1



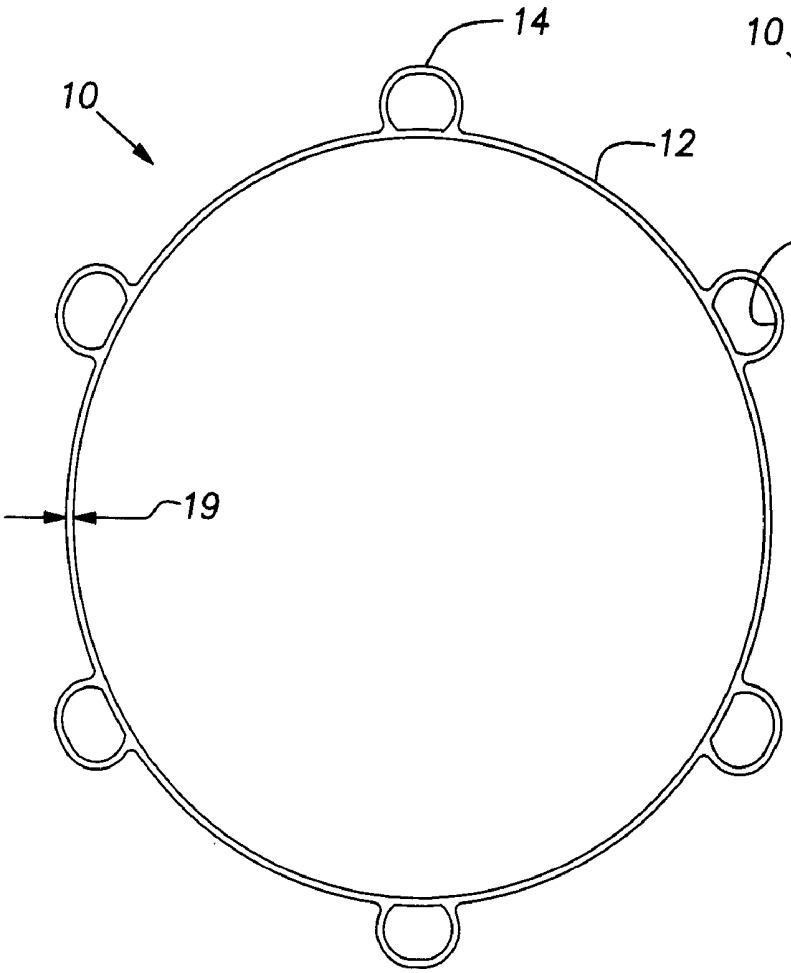


FIG. 2

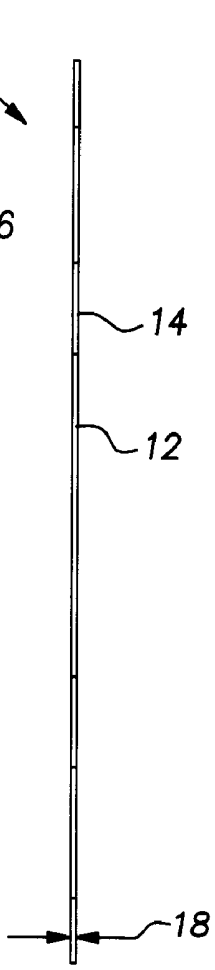


FIG. 3

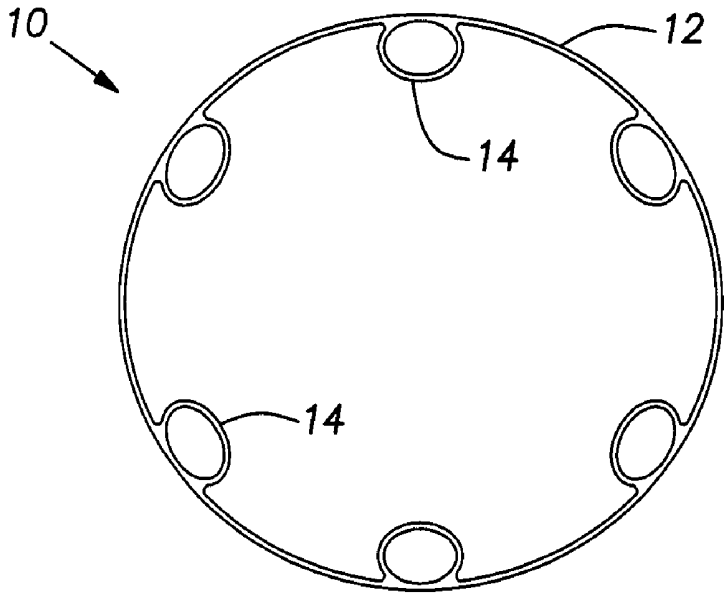


FIG. 4

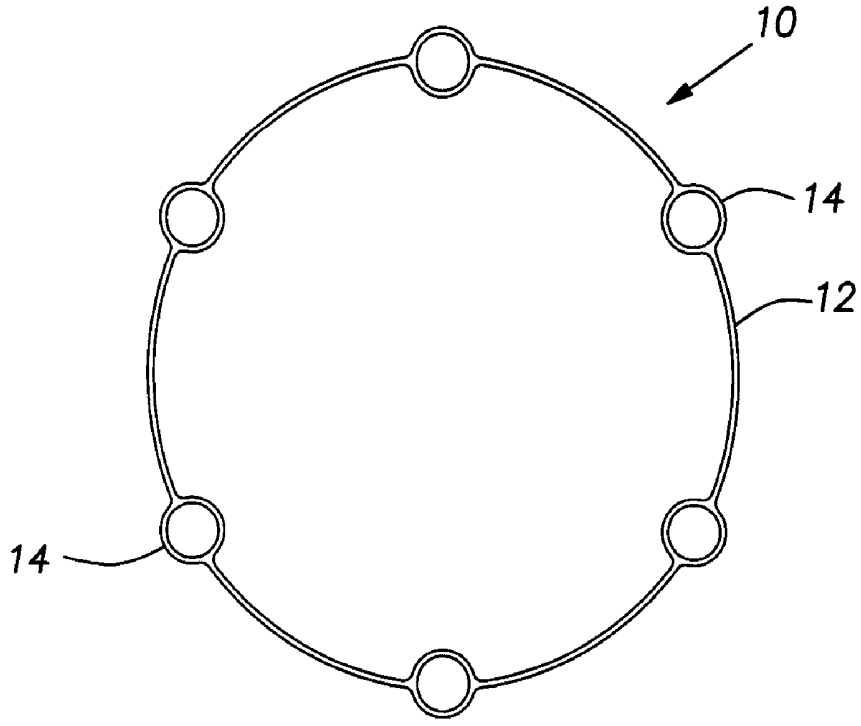


FIG. 5

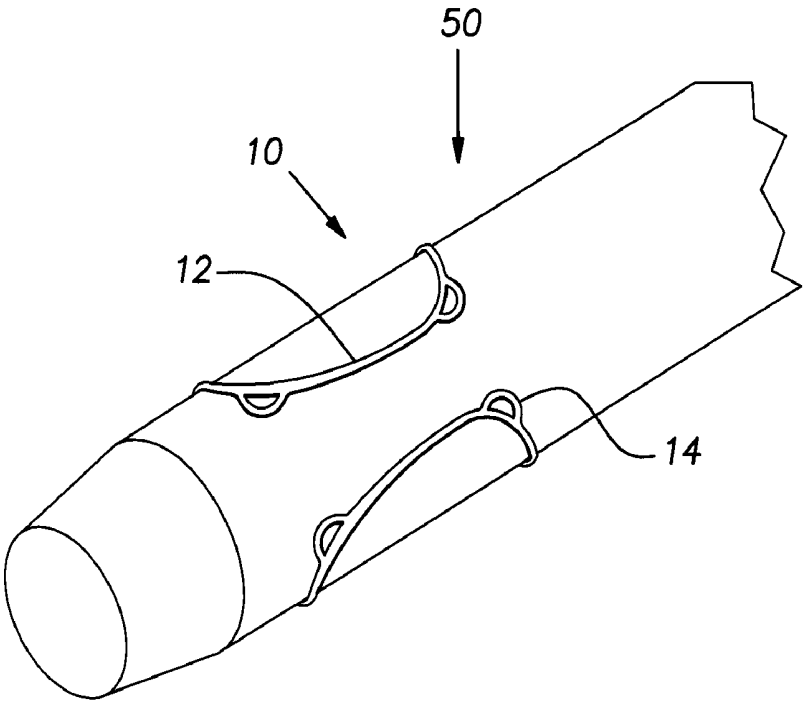


FIG. 6

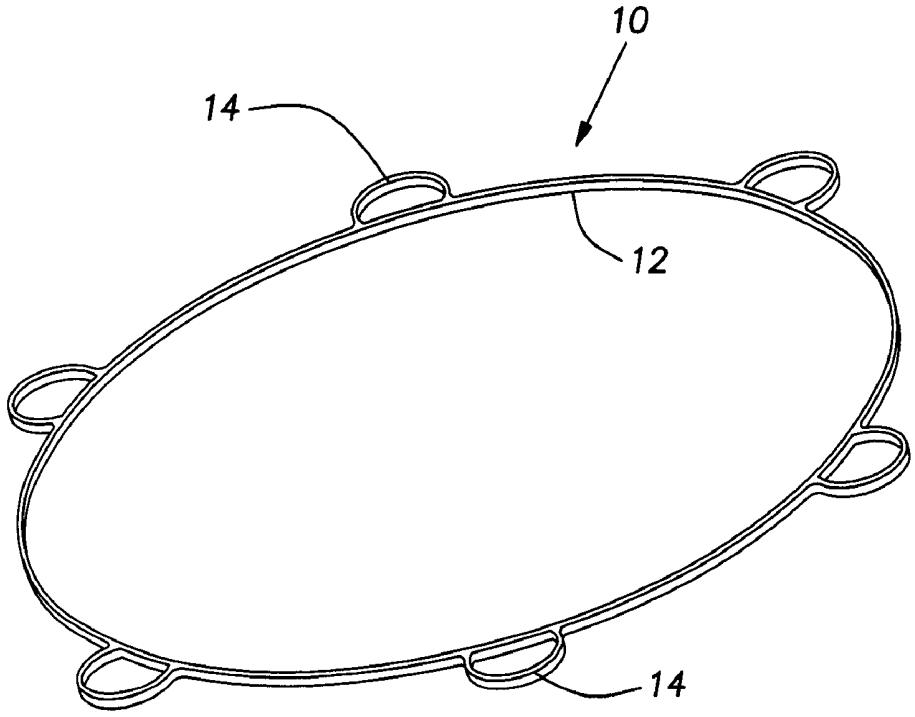


FIG. 7

SURGICAL MARKER/CONNECTOR AND METHOD OF INSTALLATION

REFERENCE TO RELATED APPLICATION

The present application is a continuation-in-part of application Ser. No. 11/112,292, filed Apr. 22, 2005 by Helmut Schreiber and Albert N. Santilli, entitled Surgical Marker/Connector, the disclosure of which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to surgical procedures and, more particularly, to an implantable device that can be used as a fluoroscopic marker or as a fluoroscopic marker/tissue connector and to a method of installing same.

2. Description of the Prior Art

While the present invention has application in various types of surgical procedures, it will be described in the context of gastric bypass surgery as used for the treatment of obesity. The most common gastric bypass procedure performed today is known as the Roux-en-Y gastric bypass procedure (RYGB). In the RYGB procedure, a six-inch to eight-inch incision is made that extends from the end of the sternum to just above the navel. More recently, the RYGB has been performed laparoscopically in order to minimize trauma, healing time and risk of infection. The stomach is completely divided into two unequal portions—a small upper pouch and a large lower gastric pouch (excluded stomach). The upper pouch typically measures less than about one ounce, preferably about one-half ounce, or 15 cc, while the excluded stomach remains generally intact and continues to secrete stomach juices that flow through the intestinal tract.

The small intestine is severed at a location distal of the duodenum or proximal of the jejunum. The severed end of the small intestine then is brought from the lower abdomen, behind the colon and the bypassed stomach, and joined with the upper pouch to form an end-to-end anastomosis created through a half-inch opening, also called the stoma. This rerouted segment of the small intestine is called the "Roux loop" and carries food from the upper pouch to the remainder of the intestines where the food is digested. The severed end of the segment of the duodenum that is part of the excluded stomach is connected to the Roux loop by means of an anastomotic connection. The connection is located approximately 100 cm from the stoma, and typically is made by using a stapling instrument. Prior to completion of the surgical procedure, a gastropexy commonly is performed to attach the excluded stomach to the abdominal wall or to the diaphragm, primarily to prevent the excluded stomach from being displaced within the abdominal cavity.

The RYGB procedure described permits digestive juices from the bypassed stomach, pancreas and liver to join the food stream from the small upper pouch and Roux loop to begin digesting the food. The remainder of the intestinal tract is not disturbed. Due to the small size of the upper pouch, patients are forced to eat at a slower rate and are satiated much more quickly, thereby reducing their caloric intake. Moreover, because the food enters the intestines directly, certain undesirable foods such as sweets create unpleasant feelings of nausea, diarrhea, nervousness, and sweating, which in turn discourages patients from developing or maintaining unhealthy eating habits. The RYGB procedure typically demonstrates a loss of at least 50% of excess body weight; approximately 60% of the patients will be able to maintain this weight loss for at least five years.

In certain cases it is necessary to perform post-operative surgical procedures. For example, some patients require that the excluded stomach be decompressed post-operatively. In order to accommodate this possibility, it has been known to insert a gastrostomy tube through the abdominal wall and into the excluded stomach and leave it there for several days until the need for decompression passes. In such cases, the gastrostomy tube has been provided with a silastic ring having a metal marker. The metal marker permits the excluded stomach to be quickly and accurately located in the abdominal cavity by fluoroscopic examination. While the practice of inserting a gastrostomy tube is effective to avoid the need for post-operative decompression, it also is an unnecessary procedure for many patients. Experience with patients that have not been fitted with a gastrostomy tube at the time of surgery shows that decompression is needed only in about one out of every 50-75 patients.

A problem in performing decompression in patients that have not had a gastrostomy tube inserted at the time of surgery is that the large pouch cannot be located accurately and, once located, cannot be held in a stable position for purposes of inserting an endoscope or trochar/cannula. In order to deal with such problems, it has been known to perform the gastropexy by using a circular wire suture having a diameter of approximately one inch. Because the suture is made of metal, it serves as a marker for fluoroscopic location of the bypassed stomach. The suture also assists in stabilizing the excluded stomach for post-operative insertion of an endoscope or a trochar/cannula.

The use of markers to subsequently locate areas of surgical interest is well known, particularly in the field of breast biopsies. See, for example, U.S. Pat. Nos. 4,592,356; 5,059,197; 5,158,084; 5,197,482; 5,221,269; 5,409,004; 5,709,697; 5,989,265; 6,356,782 and 6,405,733. In general, these patents disclose the concept of using metallic tissue markers that are implanted or otherwise attached to an internal portion of a patient's body. FIGS. **2**B and **2**C of the '782 patent disclose ring-like markers, while the '269 patent discloses a helical wire marker. Many of the patents in question disclose barbs of various types to retain the marker in place.

A problem with prior markers is that they have been difficult to use and install. In particular, such markers have not facilitated the attachment of the marker to the portion of the body to be marked. Moreover, such markers have not facilitated the attachment of one portion of the body to another. Although the use of hooks or barbs makes the implantation of a marker easier to perform, such hooks or barbs are generally undesirable for purposes of long-term retention of the marker. The use of a wire suture, while effective as a marker and connector, generally is undesirable because it can be difficult to install. Moreover, a wire suture also may not provide an effective technique to hold tissue in place for purposes of inserting objects such as an endoscope or a trochar.

Desirably, a surgical marker/connector would be available that would be easy to use and install, and which would permit portions of the body that need to be connected to each other to be connected in a convenient and secure manner. Preferably the marker/connector would be made of a material that would facilitate location by fluoroscopic techniques. In the particular case of a gastropexy performed as part of the RYGB procedure, the marker/connector preferably would permit an endoscope or a trochar/cannula to be inserted quickly and accurately.

SUMMARY OF THE INVENTION

In response to the foregoing concerns, the present invention provides a new and improved surgical marker/connector

and a method of installing same. The marker/connector according to the invention is in the form of a ring. In order to serve as a fluoroscopic marker/connector, at least a portion of the marker/connector is made of a metal such as stainless steel, titanium, or alloys thereof. Preferably, the marker/connector is made of a shape memory alloy (also known as memory metal) due to the unique memory properties of this material.

In the preferred embodiment, the ring is circular and includes a plurality of suture attachments. The suture attachments preferably are in the form of small loops that are disposed about the periphery of the ring. The loops preferably lie in a plane that includes the ring itself. The loops are large enough to receive sutures which, in turn, can be used to connect the marker/connector to a portion of a patient's body, or to connect separate portions of a patient's body to each other using the marker/connector as an intermediate connector. For example, in the RYGB procedure, the marker/connector could be sewn to a portion of a patient's excluded stomach for which marking is desired, or it could be used as an intermediate connection between a desired portion of the patient's excluded stomach and another portion of the patient's body, such as the abdominal wall.

Installation of the marker/connector according to the invention can be accomplished easily. If the marker/connector is made of a shape memory alloy, it can be installed laparoscopically. In such an installation procedure, the marker/connector can be folded about an elongate member such as a mandrel or the jaws of a clip and then inserted into the abdominal cavity through a trochar or cannula. After the marker/connector is inside the abdominal cavity, it will be warmed to body temperature where it will unfold and resume its normal, generally flat configuration. The marker/connector then can be sutured into a desired location within the abdominal cavity.

If the marker/connector has suture attachments, such attachments make the marker/connector according to the invention easy to install. Because the marker/connector is made partially or entirely of metal, it can serve as an effective fluoroscopic marker. In the particular case of the RYGB procedure, because the ring is securely attached to the excluded stomach and to the abdominal wall or to the diaphragm, the ring can be a target through which an endoscope or a trochar/cannula can be inserted. The ring prevents the excluded stomach from moving as the endoscope or trochar is inserted, thereby greatly facilitating the procedure.

The foregoing and other features and advantages of the invention will be apparent from a review of the following description of the invention, taken together with the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic view of a patient's stomach and small intestine after undergoing the RYGB procedure in which a surgical marker/connector according to the invention has been employed;

FIG. **2** is a top plan view of a surgical marker/connector according to the invention;

FIG. **3** is a side elevation view of the surgical marker/connector of FIG. **2**;

FIG. **4** is a top plan view of a surgical marker/connector according to the invention in which loops are disposed about the inner periphery of a non-circular ring;

FIG. **5** is a top plan view of a surgical marker/connector according to the invention in which loops are incorporated as part of a ring;

FIG. **6** is a perspective view of a surgical marker/connector according to the invention made of a shape memory alloy which has been wrapped about an elongate member prior to laparoscopic installation; and

FIG. **7** is a perspective view of the surgical marker/connector of FIG. **6** after it has been warmed in a patient's body subsequent to laparoscopic installation.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. **1-3**, a surgical marker/connector according to the invention is indicated generally by the reference numeral **10**. As shown in FIGS. **2** and **3**, the marker/connector **10** includes a circular ring of fixed dimensions having an inner diameter and an outer diameter **12** from which a plurality of small loops or suture attachments **14** project and are disposed equidistantly about the periphery thereof. The ring **12** is approximately one inch in diameter. The loops **14** are generally elliptical in shape, being defined by circular inner side portions **16** approximately 0.0413 inch in diameter, whose centers are separated by approximately 0.0075 inch. As can be seen in FIG. **3**, the ring **12** and the loops **14** substantially lie in a common plane. The area of the opening defined by each of the loops **14** is substantially smaller than the area of the opening defined by the inner diameter of the ring **12**.

It is expected that the marker/connector **10** can be made of any material suitable for use in the human body and which will perform a fluoroscopic marking function and a mechanical connector function. The marker/connector **10** can be made in any type of manufacturing operation. The entire marker/connector **10** can be made of metal such as stainless steel, titanium, or alloys thereof in a stamping or laser cutting operation, although only portions of the marker/connector **10** need to be made of metal provided the remainder is strong enough to perform a mechanical connector function. The marker/connector **10** also can be made of a shape memory alloy metal (memory metal) such as NITINOL. This material can be reconfigured into a new shape which will be maintained at room temperature. If the temperature should increase to a pre-determined temperature that can be selected by the user (e.g. body temperature), the material will resume its original configuration.

The marker/connector **10** can be made in any desired thickness, as indicated by the reference numeral **18** in FIG. **3**, although a thickness of about 0.0085 inch is preferred. The width of the ring **12** and the loops **14**, as indicated by the reference numeral **19** in FIG. **2**, is about 0.010 inch. The size and shape of the ring **12**, the size and shape of the loops **14**, and the relative sizes thereof can be chosen to fit the surgical procedure at hand. As a general design constraint, however, the ring **12** should be large enough to be an effective fluoroscopic marker/connector, an effective tissue connector, and a target for an endoscope or a trochar. The loops **14** should be large enough to enable the surgeon to easily pass a needle and suture therethrough.

Although the ring **12** has been described as circular, it will be understood that the ring **12** can be any desired shape, including non-circular shapes such as elliptical, square, etc. See FIG. **4**, for example, where the ring **12** is slightly elliptical. In addition, the loops **14** could be shapes other than generally elliptical, such as round, square, etc. See FIG. **5**, for example, where the loops **14** are circular. By way of further example, some or all of the loops **14** could be disposed on the inner diameter of the ring **12** (see FIG. **4**) or some or all of the loops **14** could be formed as part of the ring **12** itself (see FIG.

5). Furthermore, although use of the loops **14** is preferred and highly desired, it will be understood that the ring **12** could be used without loops **14**, if necessary or desired. Such a loopless ring **12** would not enjoy all of the benefits of the present invention, except as noted hereinafter.

Referring now particularly to FIG. **1**, the use of the marker/connector **10** in the RYGB procedure is illustrated. The patient's stomach **20** is completely divided into two unequal portions—a small upper pouch **22** and a large lower gastric pouch **24** (or excluded stomach). The upper pouch **22** typically measures less than about one ounce, preferably about one-half ounce, or 15 cc, while the larger lower pouch **24** remains generally intact and continues to secrete stomach juices that flow through the intestinal tract.

The small intestine **26** is severed at a location distal of the duodenum **28** or proximal of the jejunum (not shown). The severed end **30** of the small intestine then is brought from the lower abdomen, behind the colon and the bypassed stomach, and joined with the upper pouch **22** to form an end-to-end anastomosis **32** created through a half-inch opening, also called the stoma. This rerouted segment **34** of the small intestine is called the "Roux loop" and carries food from the upper pouch **22** to the remainder of the intestines where the food is digested. The severed end **36** of the segment of the duodenum **28** that is attached to the lower pouch **24** of the stomach **20** is connected to the Roux loop **34** by means of an anastomotic connection indicated at **38**. The connection **38** is located approximately 100 cm from the stoma **32**, and typically is made by using a stapling instrument.

A gastropexy is performed, whereby the excluded stomach **24** is connected to the abdominal wall **40** by means of the marker/connector **10**. Sutures **42** are passed through the loops **14** and through the tissue of the adjacent pouch **24** and the abdominal wall **40**. The marker/connector **10** thus serves as a fluoroscopic marker as well as a mechanical connector between the excluded stomach **24** and the abdominal wall **40**. If it is necessary to insert an endoscope or a trochar into the excluded stomach **24**, the endoscope or trochar can be inserted through the ring **12** which will serve as a target as well as a means for holding the excluded stomach **24** in place as the endoscope or trochar is inserted therethrough.

Referring now to FIGS. **6** and **7**, the marker/connector **10** illustrated therein is made of a shape memory alloy (memory metal) such as NITINOL, preferably with a relax or "resume" temperature of about 98 degrees Fahrenheit. If the ring **12** is made of such a material, it can be wrapped tightly about an elongate member **50** and will retain its position there as shown in FIG. **6**. The member **50** can be a specially formed mandrel, one or both jaws of a clip, or a similar elongate, slender object. After the ring **12** has been wrapped about the member **50**, it can be inserted into a patient's abdominal cavity laparoscopically, typically by passing it through a trochar or cannula (not shown). After the marker/connector **10** has been inserted into the abdominal cavity and warmed to body temperature, it will resume its original shape (see FIG. **7**), whereupon the marker/connector **10** can be sutured in place using conventional laparoscopic suturing techniques. If the ring **12** is not provided with loops **14**, the loopless ring **12** still can be installed laparoscopically, but suturing of the ring **12** will be more difficult as indicated previously. Accordingly, use of the loops **14** is preferred.

As will be apparent from the foregoing description, the surgical marker/connector **10** according to the invention is easy to install. The marker/connector **10** avoids the use of undesirable hooks or barbs, while permitting the surgeon to securely attach the marker/connector to a desired portion of a patient's body. In those instances where the marker/connector **10** is used as a mechanical connector between adjacent portions of the patient's body, the connection is easy to make and is quite secure and strong. The ring **12** provides a target through which an endoscope or a trochar can be inserted, if necessary

Although the invention has been described in its preferred form with a certain degree of particularity, it will be understood that the present disclosure of the preferred embodiment has been made only by way of example and that various changes may be resorted to without departing from the true spirit and scope of the invention as hereinafter claimed. It is intended that the patent shall cover, by suitable expression in the appended claims, whatever features of patentable novelty exist in the invention disclosed.

What is claimed is:

1. A surgical marker/connector for installation in a patient, comprising:

a closed, thin ring of fixed dimensions lying substantially in a single plane and having an absence of hooks or barbs, the ring being made of a biocompatible shape memory alloy material suitable for fluoroscopic marking and having a strength suitable for connecting tissue;

the ring having an inner diameter and an outer diameter, the inner diameter defining an opening of a size and shape suitable for being pierced by an endoscope or a trochar when the ring is installed in a patient;

a plurality of suture attachments disposed about the periphery of the ring and lying in the plane in which the ring lies, the suture attachments being disposed on the inner diameter of the ring, the outer diameter of the ring, forming a portion of the ring, or combinations thereof; and

the suture attachments being in the form of small loops, each loop defining an opening of a size and shape through which a needle and suture can be passed, the area of each of the loops being substantially smaller than the area of the opening defined by the inner diameter of the ring.

2. The surgical marker/connector of claim **1**, wherein the suture attachments are disposed equidistantly about the periphery of the ring.

3. The surgical marker/connector of claim **1**, wherein six suture attachments are provided.

4. The surgical marker/connector of claim **1**, wherein the area of the opening defined by the inner diameter of the ring is approximately 0.785 square inch and the area of the opening defined by each loop is approximately 0.00785 square inch.

5. The surgical marker/connector of claim **1**, wherein the ring and the loops have a thickness and a width, the thickness being approximately 0.0085 inch and the width being approximately 0.010 inch.

6. The surgical marker/connector of claim **1**, wherein the suture attachments are disposed on the outer diameter of the ring.

7. The surgical marker/connector of claim **1**, wherein the ring is circular and the suture attachments are generally elliptical.

8. The surgical marker/connector of claim **1**, wherein the ring and the suture attachments are made of the same material.

9. The surgical marker/connector of claim **1**, wherein the ring and the suture attachments are made of NITINOL shape memory alloy.

10. The surgical marker/connector of claim **1**, wherein the ring has a relax temperature of about 98 degrees Fahrenheit.

11. The surgical marker/connector of claim 1, wherein the ring and the suture attachments are made in a laser cutting or a stamping operation.

12. A surgical marker/connector for installation in a patient, comprising:

a closed, thin ring of fixed dimensions lying substantially in a single plane and having an absence of hooks or barbs, the ring being made of a biocompatible material suitable for fluoroscopic marking and having a strength suitable for connecting tissue;

the ring having an inner diameter and an outer diameter, the inner diameter defining a generally circular opening having an area of approximately 0.785 square inch;

six suture attachments disposed equidistantly about the periphery of the ring and lying in the plane in which the ring lies, the suture attachments being disposed on the inner diameter of the ring, the outer diameter of the ring, forming a portion of the ring, or combinations thereof;

the suture attachments being in the form of generally elliptical loops each defining an opening having an area of approximately 0.00785 square inch;

the ring and the loops having a width and a thickness, the thickness being approximately 0.0085 inch and the width being approximately 0.010 inch; and

the ring and the suture attachments being made of a biocompatible shape memory alloy having a relax temperature of about 98 degrees Fahrenheit.

13. The surgical marker/connector of claim 12, wherein the ring and the suture attachments are made of NITINOL shape memory alloy.

14. The surgical marker/connector of claim 12, wherein the suture attachments are disposed on the outer diameter of the ring.

15. The surgical marker/connector of claim 12, wherein the ring and the suture attachments are made in a laser cutting or a stamping operation.

* * * * *

专利名称(译)	手术标记/连接器和安装方法		
公开(公告)号	US7931662	公开(公告)日	2011-04-26
申请号	US11/696901	申请日	2007-04-05
[标]申请(专利权)人(译)	SCHREIBER HELMUT 桑蒂利ALBERTñ		
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当前申请(专利权)人(译)	SCHREIBER HELMUT 桑蒂利ALBERTñ		
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助理审查员(译)	帕特尔PRITESH		
其他公开文献	US20070185507A1		
外部链接	Espacenet USPTO		

摘要(译)

由诸如NITINOL的形状记忆合金制成的环形手术标记/连接器适合于在患者体内进行腹腔镜安装。环优选地包括多个呈环形的小缝合线附件，其设置在环的周边上并且位于包括环本身的平面中。环足够大以接收缝线，缝线又可用于将环连接到患者身体的一部分，或者使用标记/连接器作为中间连接器将患者身体的各个部分彼此连接。在安装之前，环可以围绕细长构件（例如心轴）紧紧地缠绕，该细长构件可以通过套管针或套管插入患者体内。插入后，环将改变温度并恢复其原始配置，可根据需要将其缝合到位。