



# Brazilian Journal of Videoendoscopic Surgery

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# Case Reports and Case Series in the Era of Evidence - Based Medicine

## Relatos e Série de Casos na Era da Medicina Baseada em Evidência

RAPHAEL CÂMARA MEDEIROS PARENTE<sup>1</sup>; MARCO AURÉLIO PINHO DE OLIVEIRA<sup>2</sup>;  
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### ABSTRACT:

Case reports and case series are important parts of the medical literature that continue to have their place in scientific journals. Frequently they are the first evidence for new therapies. Reports of cases and series are considered a low level of evidence their various arguments for and against their use in the incorporation of new treatments. Creative and critical use of these studies can increase a historical value by enriching the practice of medicine. The “methodology” used to report cases and the topics chosen to reflect our growing pragmatic approach in relation to evidence and arguments related to medicine and other health sciences.

**Key words:** Case reports; Case series; Reports methodology.

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### ARTICLE

During much of medicine’s history case reports were the only source of scientific information. Most of the principles of the main surgical techniques that persist today came from contribution from this type of study. As an example, we cite cesarean section – the most frequently performed surgery in the world – which improved over time based almost exclusively on case reports.

With the emergence of evidence-based medicine, this type of study became the “ugly duckling” of the medical literature, and indeed many journal editors avoid publishing case reports. The case report is the type of study that most associated with the clinician; it sharpens the interpretation of signs and symptoms and is great material for discussions that stimulate learning among young doctors.

These days the pressure for those in academic careers to publish in scientific journals is greater than ever. The rallying cry among researchers in academia is “*publish or perish.*” In this competitive climate, exacerbated by journals accepting such articles, some academicians distort the purpose of case and series

reports, and gravitate to them because they are considered easier and quicker to elaborate and write. With this, there are growing numbers of case report articles of low-quality and of limited value to the scientific community

This study design has and will continue to have considerable value and guaranteed space in research, but we should know when to carry them out and what care should be taken with them.

Even today, case and series reports remain an important part of medical journals and continue to be published in various prestigious journals such as *The Lancet* and the *New England Journal of Medicine*. Generally, such articles are the first reports evidence for new treatments (surgical or medical) and for the identification of rare adverse effects of medications.<sup>1</sup>

Although the distinction between the two types of studies is subjective and debated by scholars, a case report typically does not include more than three cases, while a case series is understood to include anywhere from three to ten cases according to some authors and potentially more than that this number according to other authors.<sup>2</sup>

Case reports are a detailed description of clinical cases containing important details about signs, symptoms, and other patient characteristics, and report the therapeutic procedures used, as well as the outcome of the case. Such reports are clearly indicated in cases of rare diseases, especially those for which neither the diagnosis nor the treatment are yet clearly established in the scientific literature.

In a hierarchical order with regard to level of evidence, case reports and case series rank below clinical trials (Table 1). Exactly for this reason, a study of this type should only be published in a specialized journal when it meets well-defined goals and objectives. A good case report should have the objective of conferring some benefit either to current clinical practice or by identifying possible new directions for research of a specific theme in which one or a few individuals can be representative. Such cases would propose innovative approaches to diagnosis or treatment, or how to formulate hypotheses that can be tested using other study designs. In addition, in certain situations, a case report is an initial study which becomes the basis for the elaboration of larger studies.<sup>3</sup> Case reports are also important as they permit the accumulation of cases which create the conditions for the early perception of a new or resurgent epidemic.

Clear indications for case series reports include: the detection of epidemics, to describe the characteristics of new diseases, to formulate hypotheses about possible causes of a disease, to present results of therapies for rare diseases, and to report rare adverse effects in common diseases. The principal disadvantages of these studies include: conclusions based on few cases, not being sure that

you have a representative sample, not having a methodology capable of validating a causal relationship, not having any control group for comparison, not quantifying the prevalence in the population, and a diagnostic methodology that is not standardized.

Case reports classically have great importance in rare diseases. This is due to the fact that the compilation of a certain number of cases is practically impossible in any single study. Treatments are evaluated with regard to success or failure in a single individual and knowledge acquired from this “trial and error” is applied to the next case. A recent example was the use of a novel treatment for rabies that was initially tested in the United States that generated the first case of survival with established disease<sup>5</sup> which then was used in two more cases, including one in Brazil, widely reported by the press.

The conclusions that can be taken away from the studies are generally limited by the small number of individuals and because of the absence of a control group. The efficacy of the treatment can only be demonstrated under the rarest of circumstances: when no other treatment is available and the improvement is dramatic. Case reports can never be used to demonstrate the safety of a treatment or intervention because of the rarity of some side effects. The main problem with the use of case reports to support a novel therapy is that generally only case reports of cases that were successful are published, which constitutes a publication bias. One study found that more than 90% of case reports published in a particular period referred to positive outcomes.<sup>3</sup>

Besides the fact that they are considered a lower level of evidence, case reports are less

**Table 1** – Levels of evidence according to type of study for treatments and prevention programs. (YUSUF *et al.*, 1998)<sup>4</sup>.

Level	Type of study
1a	Systematic Revision of homogeneous of randomized controlled trials
1b	Randomized controlled trials with narrow confidence intervals
2a	Systematic Revision of homogeneous cohort studies
2b	Cohort study or clinical trials of limited methodologic rigor
2c	Ecologic study
3a	Systematic Revision of homogeneous case-control studies
3b	Case-control study
4	Case series report or cohort studies and case-control studies of limited methodologic rigor
5	Opinion of specialists

frequently cited by authors as compared with other studies such as clinical trials and meta-analyses. In the unbridled quest for a higher impact factor (an indicator of the influence of a scientific periodical), editors of the most important journals have largely discredited case and series reports, only publishing those that are considered really relevant and that contribute advances to a given subject.<sup>6</sup>

Gynecology is replete with advances that can be attributed to case and series reports. Endometriosis was first described by Rokitansky in 1860<sup>7</sup> in cases reports, and our understanding of the pathogenesis of this disease stems from observations Sampson described in case reports of his patients.<sup>8,9</sup> Stein and Leventhal described polycystic ovarian syndrome in 1935 based on the data of seven patients, which constituted an elegant example of a case series.<sup>10</sup> Case reports can be the initial alarm about side effects not seen in animal and human trials. The most notorious example of this was thalidomide, a drug licensed for the treatment of nausea in pregnancy. With the initial case report<sup>11</sup> and, later with various others, its teratogenicity was demonstrated, and soon after it was withdrawn from the market. In our field, the first report of laparoscopic treatment of cervical cancer with lymphadenectomy in Brazil was published in this journal in the 1990s.<sup>12</sup> The etiology of endometrial osseous metaplasia was described by our group in 2009 in a case series report<sup>13</sup> that was published in *Obstetrics and Gynecology*, the most influential journal of the specialty, which demonstrates that there is a place for these studies in high quality publications.

In summary, a good case report should have five attributes:<sup>3</sup>

1. It addresses an important issue;
2. It raises a single interesting question that is clearly formulated so it can be answered;
3. The article presents the case follows a standard structure (that will be described below);
4. Written in a way that is compatible with the journal chosen for publication;
5. Presents conclusions and answers consistent with the limitations of a case report.

After making the decision to write a case report right, the author that is convinced that study will be relevant to the scientific community and not just following the impetus to publish another article, should do it in the most elaborate way possible. Although criteria that should be used – such as a *checklist* – prior to writing a case report and the

bases for evaluating the quality of the case report are not well defined in the literature, and despite the fact that the search for methodologic errors in a type of article in which the methods are very flexible and whose principal characteristic is “absence” of planning is quite difficult, we will still try to provide key points.

The case should be described with all the relevant details yet in a succinct way. The description should include age, sex, clinical history, comorbidities, and the clinical outcomes of interest. The intervention, if there is one, should be described in sufficient detail so that it may be reproduced by other researchers. If it concerns a medication, one should describe the dose, the frequency of administration, and the duration of treatment. Elements that demonstrate quality in a case report are:

1. Clearly defined diagnostic criteria;
2. Informed consent from all described patients;
3. Approval from the Ethics Committee for a prospective case series;
4. Details of the intervention (drug or surgery, for example) are described;
5. Clearly defined and relevant clinical outcomes;
6. Description of the perception of the patient with regard to the intervention performed and the clinical outcome;
7. Description of the risks associated with the intervention;
8. Clearly defined inclusion and exclusion criteria;

In relation to this final item, we should note that case reports don't have methods and most include only a single case. A REPORT is not RESEARCH, because it is not planned. A case worthy of being reported is something that falls into the lap of a clinician by chance.

In conclusion, the main question that should be asked by someone considering reporting a case or a series of cases is: am I contributing in a substantial way to the understanding and treatment of this disease or to a NEW disease? If the answer is affirmative, every care should be taken to present the cases in the most ethical and constructive way for the management of a given infirmity, limiting our conclusions to that which is possible with the study design in question.<sup>14,15</sup> More elaborate and conclusive answers should be left to studies with higher levels of evidence that may

carried out in the future. If the answer is negative, one should not seek publication only as a form of personal triumph that will contribute little to science. Of course, for those who choose this selfish path, there's always the editor-in-chief of the most influential journal who can reject studies that would not contribute to science. International journals with a high impact factor only accept unprecedented case reports that have the potential to challenge current theories about the etiopathogenesis of the disease or that bring to light an innovative treatment. Case reports often are nothing more than "medical curiosities" that from a practical standpoint do not add to our understanding

of the disease in question. Many are published by authors that are not part of a research group focused on a well-defined problem.

These studies have and will continue to have their place in the literature even with all the new intricate statistical methods and with the supremacy of clinical trials and meta-analyses in the hierarchy of evidence. But it is incumbent upon researchers and journal editors to not transform case reports into an object of personal accomplishment and the conquest of goals to fulfill rigid publication goals now applied to all those involved in research pursuing advancement in their careers.

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#### RESUMO:

Relatos e série de casos são integrantes importantes da literatura médica e continuam a terem seus espaços nas revistas científicas. Frequentemente, eles são a primeira evidência para novas terapias. Relatos e série de casos têm pequeno nível de evidência e há vários argumentos contra o uso deles para a instituição de novas terapias. O uso criativo e crítico destes estudos pode aumentar seu valor histórico no enriquecimento da experiência na medicina. Sua "metodologia" e tópicos devem ser desenvolvidos sob a luz da nossa crescente abordagem pragmática em relação às evidências e argumentações de assuntos relacionados à medicina e outras ciências da saúde.

**Palavra chave:** Relato de caso; serie de casos; metodologia de relatos.

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# Relatos e Série de Casos na Era da Medicina Baseada em Evidência

## Case Reports and Case Series in the Era of Evidence - Based Medicine

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### RESUMO:

Relatos e série de casos são integrantes importantes da literatura médica e continuam a terem seus espaços nas revistas científicas. Frequentemente, eles são a primeira evidência para novas terapias. Relatos e série de casos têm pequeno nível de evidência e há vários argumentos contra o uso deles para a instituição de novas terapias. O uso criativo e crítico destes estudos pode aumentar seu valor histórico no enriquecimento da experiência na medicina. Sua "metodologia" e tópicos devem ser desenvolvidos sob a luz da nossa crescente abordagem pragmática em relação às evidências e argumentações de assuntos relacionados à medicina e outras ciências da saúde.

**Palavra chave:** Relato de caso; serie de casos; metodologia de relatos.

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### ARTIGO

Os relatos de casos foram durante muito tempo a única base de informações científicas da medicina. Grande parte das bases das principais técnicas cirúrgicas que perduram até hoje foram advindas deste tipo de estudo. Como grande exemplo, citemos a cesariana que é a cirurgia mais realizada no mundo que foi aprimorada praticamente toda baseada em relatos de casos. Com o surgimento da medicina baseada em evidências, este tipo de estudo virou o "patinho feio" da literatura médica, onde vários editores de periódicos evitam publicação destes casos. O relato de caso é o estudo que mais se identifica com o médico clínico. Aguça a interpretação de sinais e sintomas e é farto material para discussões que solavancam o aprendizado de jovens médicos.

Atualmente, é grande a pressão para publicação em revistas científicas para sustentar a carreira acadêmica, tornando cada vez mais presente entre os pesquisadores a expressão "publish or perish" (publique ou pereça). Neste clima de competição exarcebada por aceites de periódicos, alguns membros

da área acadêmica deturpam a função dos estudos do tipo relato e série de casos por os considerarem mais fáceis e rápidos de serem elaborados e escritos. Com isto, cresce o número de estudos de baixa qualidade e pouco valor para a comunidade científica.

Este desenho de estudo tem e terá por muito tempo bastante valia e espaço garantido na pesquisa, mas devemos saber quando realizá-lo e que cuidados tomar em sua realização.

Relatos de casos e séries de casos são, ainda hoje, integrantes importantes das publicações médicas e continuam a serem publicados em vários importantes periódicos como *Lancet* e *New England*. Geralmente, são a primeira fonte de evidências para novas terapias (cirúrgicas ou clínicas) e para detecção de efeitos adversos raros de medicamentos<sup>1</sup>.

Embora a diferenciação entre os dois tipos de estudos seja subjetiva e divergente entre os autores, um relato de caso engloba não mais que três casos e uma série de casos compreende de três a 10 casos segundo alguns e mais do que isto de acordo com outros autores<sup>2</sup>.

Relatos são a descrição detalhada de casos clínicos, contendo características importantes sobre

os sinais, sintomas e outras características do paciente e relatando os procedimentos terapêuticos utilizados, bem como o desenlace do caso. Possuem indicação clara em situações de doenças raras, para as quais tanto o diagnóstico como a terapêutica não estão claramente estabelecidos na literatura científica.

Relatos e séries de casos ocupam posições hierarquicamente inferiores em relação ao nível de evidência de um estudo quando comparados, por exemplo, com ensaios clínicos (Tabela 1). Exatamente por este fato, um estudo deste tipo somente deve ser publicado em revista especializada quando englobam objetivos e propósitos definidos. Um bom relato de caso deve ter o objetivo de acrescentar benefícios às práticas atuais ou de traçar possíveis novas direções na pesquisa de determinado tema em que um único ou poucos indivíduos possam ser representativos. Propõe formas inovadoras na abordagem de uma doença ou tratamento, além da formulação de novas hipóteses que podem ser testadas em outros desenhos de estudo. Além disto, em determinadas situações, é um estudo inicial para a elaboração de estudos maiores<sup>3</sup>. São ainda importantes para detecção de epidemias.

Como indicações claras de relato e série de casos teríamos: detecção de epidemias, descrição de características de novas doenças, formulação de hipóteses sobre possíveis causas para doenças, descrição de resultados de terapias propostas para doenças raras e de efeitos adversos raros em doenças comuns. Como principais desvantagens destes estudos temos: conclusões baseiam-se em poucos casos, não possuem amostragem representativa e metodologia capaz de validar associação causal, não há grupo controle para comparação, não quantifica a prevalência na

população e a metodologia de diagnóstico não é padronizada.

Uma situação em que classicamente o relato de caso tem uma grande importância é no estudo de doenças raras. Isto se deve ao fato de ser praticamente impossível a compilação de vários casos de pacientes em um único estudo. Terapêuticas são avaliadas quanto ao sucesso e ao fracasso num único indivíduo e aprendizagens destes "erros e acertos" são apreendidos para um próximo caso. Exemplo recente disto é o uso de uma terapia contra raiva que foi inicialmente testada nos Estados Unidos que propiciou o primeiro caso de sobrevivência com a doença instalada<sup>5</sup> e que depois foi utilizada em mais dois casos no mundo, sendo um no Brasil, noticiado amplamente pela imprensa.

As conclusões que podem ser retiradas destes estudos são geralmente limitadas pelo pequeno número de indivíduos e pela ausência de um grupo-controle. Somente podem demonstrar eficácia de um tratamento sob raríssimas condições (melhora dramática e quando não há outra terapia disponível). Jamais podem ser utilizados para demonstração de segurança de uma intervenção devido à raridade de alguns efeitos adversos. O principal problema no uso de relatos de casos para a instituição de uma terapia nova é que geralmente somente são publicados aqueles casos que tiveram sucesso com a intervenção o que constitui o viés de publicação. Uma pesquisa demonstrou que mais de 90% dos relatos de casos publicados em determinado período se referiam a sucessos<sup>3</sup>.

Além do fato de terem menor nível de evidência, os relatos de casos são menos citados por outros autores quando comparados com outros estudos como metanálises e ensaios clínicos. Na busca

**Tabela 1** - Níveis de evidência segundo os tipos de estudos para terapias e programas preventivos. (YUSUF *et al.*, 1998)<sup>4</sup>.

Nível	Tipo de estudo
1a	Revisões sistemáticas homogêneas de ensaios clínicos randomizados
1b	Ensaio clínico randomizado com intervalo de confiança estreito
2a	Revisões sistemáticas homogêneas de estudos de coorte
2b	Estudo de coorte ou ensaios clínicos de baixa qualidade metodológica
2c	Estudos ecológicos
3a	Revisões sistemáticas homogêneas de estudos de caso-controle
3b	Estudo de caso-controle
4	Relato de séries de casos ou estudos de coorte e caso-controle de baixa qualidade metodológica
5	Opinião de especialistas

desenfreada por um maior fator de impacto (fator que classifica os periódicos atualmente), os editores das importantes revistas desprestigiam relatos e séries de casos, somente publicando aqueles realmente relevantes e que acrescentem avanços a determinado assunto<sup>6</sup>.

A Ginecologia é rica em avançar com relatos e séries de casos. A endometriose foi primeiramente descrita por Rokitansky em 1860<sup>7</sup> baseado em relatos de casos, assim como a patogênese desta mesma doença também deve muito a Sampson observando e descrevendo casos de suas pacientes<sup>8,9</sup>. Stein e Leventhal descreveram a síndrome do ovário policístico em 1935 baseados em dados de sete pacientes, o que constitui um elegantíssimo exemplo de uma série de casos<sup>10</sup>. Os relatos de casos podem ser o alarme inicial para efeitos colaterais não vistos em ensaios com animais e humanos. Grande exemplo disto é a talidomida que foi liberada para o tratamento de enjoo em grávidas. Com um relato de caso inicial<sup>11</sup> e, depois com vários outros, foi comprovado que era teratogênica e, com isto, retirada do mercado. Em nosso meio, o primeiro relato de tratamento de câncer de colo uterino por via laparoscópica com linfadenectomia no Brasil foi publicado nesta revista na década de 90<sup>12</sup>. A etiologia da metaplasia óssea endometrial foi descrita por nosso grupo em 2009 num estudo de série de casos<sup>13</sup> que foi publicado na revista mais importante da especialidade, a *Obstetrics and Gynecology*, o que mostra que há lugar para publicações de alto nível com o uso destes estudos.

Resumindo, um bom relato de caso deve ter cinco características<sup>3</sup>:

1. Uma questão relevante como tema;
2. Uma questão claramente definida para ser respondida, ser único e interessante;
3. Uma apresentação que siga um roteiro que será apresentado a seguir;
4. Escrita compatível com o jornal escolhido para publicação;
5. Apresentar conclusões e respostas compatíveis com as limitações de um relato de caso;

Após a decisão de escrever um relato de caso estando o autor convicto que aquele estudo será relevante para a sociedade científica e não apenas pelo ímpeto em obter uma publicação, deve-se fazê-lo da forma mais elaborada possível. Embora critérios que devem ser utilizados como um *checklist* prévio à realização de um relato de caso assim como meios de avaliação da qualidade de um relato de caso não es-

tenham bem definidos na literatura pelo fato de que a busca de erros metodológicos em um tipo de artigo em que os métodos são muito flexíveis e cuja principal característica é a “ausência” de planejamento é algo difícil, tentaremos passar pontos que são fundamentais.

O caso deve ser descrito com todos os detalhes relevantes e de forma sucinta. A descrição deve incluir a idade, sexo, história clínica, comorbidades e desfecho de interesse. A intervenção, caso tenha, deve ser descrita em detalhes permitindo ser reproduzida por outros pesquisadores. Se for uma medicação, deve ser descrita dose, esquema de administração e duração do tratamento. Critérios que demonstram qualidade em um relato de caso são:

1. Critérios diagnósticos claramente definidos;
2. Consentimento informado de todos os pacientes descritos;
3. Aprovação de Comitê de Ética para série de casos em estudos prospectivos;
4. Detalhes da intervenção (drogas ou cirurgias, por exemplo) são descritos.
5. Desfechos clínicos relevantes e claramente definidos;
6. Descrição da percepção do paciente quanto ao desfecho e à intervenção nele efetuada;
7. Descrição de riscos associados com a intervenção;
8. Os critérios de inclusão e exclusão devem ser claramente citados;

Em relação a este último tópico, devemos atentar que relatos de casos não possuem método e a maioria possui apenas um caso. RELATO não é PESQUISA, pois não é planejado! Relato é algo que caiu na vista de um clínico por acaso.

Concluindo, a principal pergunta que deve ser feita por quem cogita relatar um caso ou uma série de casos é: estou contribuindo de forma substancial para a compreensão e tratamento desta doença ou de uma NOVA doença? Caso afirmativa a resposta, todos os cuidados devemos tomar para apresentar os casos da forma mais ética e contributiva possível para o manejo de determinada enfermidade, atendo-nos a concluir somente o possível para o desenho de estudo em questão<sup>14, 15</sup>, deixando respostas mais rebuscadas e conclusivas para estudos com maior nível de evidência que porventura aconteçam no futuro. Caso negativa, não tentemos a publicação somente como forma de regozijo pessoal que em nada contribui para a ciência. Mas para os que optarem por esta via deturpada

do método, temos o editor-chefe das importantes revistas que devem fazer o seu papel de descartar estudos que não contribuam de forma efetiva para a ciência. Revistas internacionais com alto fator de impacto somente aceitam relatos de casos inéditos com potencial de alterar a atual teoria sobre a etiopatogenia da doença ou que tragam uma terapêutica inovadora. Os relatos de caso muitas vezes são apenas “curiosidades médicas” e que praticamente não acrescentam informações relevantes ao conhecimento da doença em questão. Muitas vezes são publicados por

autores que não possuem grupos de pesquisa focados em um problema bem definido.

Estes estudos têm e continuarão tendo seu espaço mesmo com todos os intrincados novos métodos estatísticos e supremacia de ensaios clínicos e metanálises na hierarquia das evidências, mas cabe aos pesquisadores e editores de revistas não o transformarem em objeto tão somente de realização pessoal e de conquista de metas a cumprir pelos rígidos critérios atualmente vigentes para a qualificação de todos os envolvidos em pesquisa.

#### ABSTRACT:

Case reports and case series are important parts of the medical literature that continue to have their place in scientific journals. Frequently they are the first evidence for new therapies. Reports of cases and series are considered a low level of evidence their various arguments for and against their use in the incorporation of new treatments. Creative and critical use of these studies can increase a historical value by enriching the practice of medicine. The “methodology” used to report cases and the topics chosen to reflect our growing pragmatic approach in relation to evidence and arguments related to medicine and other health sciences.

**Key words:** Case reports; Case series; Reports methodology.

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# Single Trocar Access Appendectomy - Initial Experience

## Apendectomia por Acesso Trocar Simples – Experiência Inicial

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### ABSTRACT

**Objective:** To present the initial experience in the Videolaparoscopic Appendectomy by the transumbilical path, using a single port system, named Single Trocar Access - SITRACC®. **Patients and Methods:** From November 2009 to July 2010 eight SITRACC appendectomies were performed. The operation consisted of the classic laparoscopic appendectomy, using special flexible and articulated instruments. **Preliminary Results:** The average operative time was 38 minutes. No extra trocar was necessary. All patients were discharged from the hospital within 24 hours of their surgery. There were no major post-operative complications. **Discussion:** Appendectomy by the Single Trocar Access method is feasible and safe. With the improvement of the instruments and the multichannel trocar, new surgeries could be performed by this method, adding a new weapon in a continuous fight to benefit our patients.

**Key words:** Minimally Invasive Surgery, Appendectomy, Single Trocar Access.

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### INTRODUCTION

The development of endoscopic surgery, which was started in 1987 by the French surgeons Mouret and Perissat, represented the beginning of a new concept in the surgical field. It made possible surgical procedures with minimum pathophysiologic trauma, resulting in less pain and faster recovery, as well as adding more satisfactory cosmetic results.

Rapid and continuous improvement in optical technology, as well as in the instruments used in endoscopic surgery, have allowed increasingly complex operations to be accomplished with the minimally invasive methods, spreading this approach to surgical suites around the planet.

Several brand new technologies and approaches have appeared and have been evolving in parallel; these surgical revolutions include telesurgery, robotics in surgery, the use of the virtual reality in the surgical training, natural orifice transluminal endoscopic surgery (NOTES), and single port surgery.

Since Kaloo<sup>1</sup> reported his first experience with NOTES, using transgastric access in porcine models,

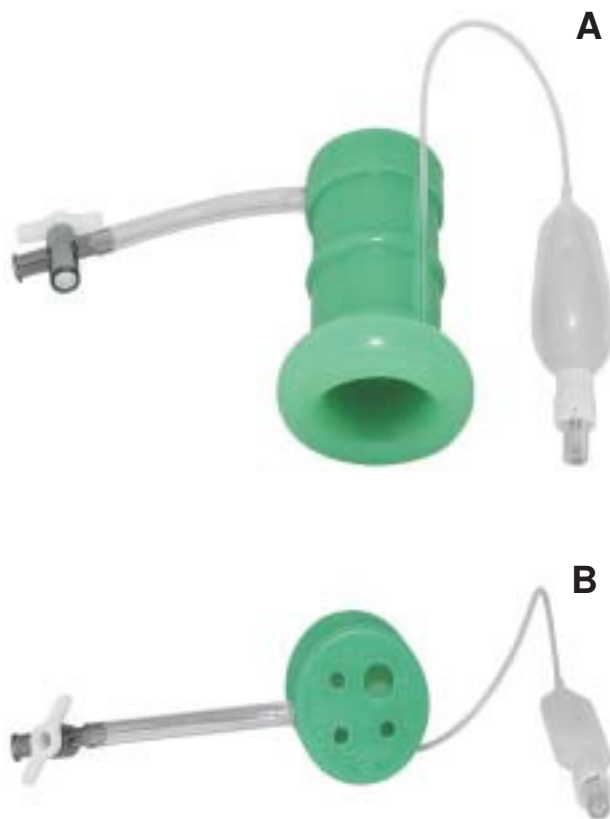
many scientists around the planet have been looking for new technologies and new surgical approaches and have been trying to determine the feasibility of these tantalizing possibilities.

Because of the current limitations of NOTES procedures (troubled access, orientation, infection, organ closure, etc.), single port surgery may be an excellent option to achieve scarless abdominal surgery, while enjoying all the advantages of a minimally invasive procedure. The Single Trocar Access - SITRACC® was created to achieve this goal.

This paper reports the first experience with SITRACC appendectomy.

### PATIENT AND METHODS

In the beginning of the research process, a single trocar access system was developed, named SITRACC®<sup>2</sup> (Edlo Company, Brazil) – (Figures 1A and 1B). This new device consists of a trocar with four channels (one 10mm and three 5mm), through which special distal articulated or flexible instruments



Figures 1A and 1B - SITRACC® Platform.

are introduced. Articulated graspers, scissors, hook and clip applicators were developed specially for this approach.

After the approval of the protocol by the Ethics Committee of the Red Cross Hospital in Curitiba, Paraná, eight Single Trocar Appendectomies were performed using the SITRACC system between November 2009 and July 2010. Five patients were male and three female; age ranged from 18 to 35.

Under general anesthesia, the patients were placed in Trendelenburg and left lateral position. The single port was introduced through the umbilicus, after the dissection of the abdominal wall, by direct visualization.

All patients had first stage appendicitis. The operation consisted of the classical steps for an appendectomy. Two clips were applied at the base of the appendix and at the proximal segment of the appendicular artery. No cases required the introduction of a second trocar.

The average operative time was 38 minutes. There were no significant post-

operative complications. All patients were discharged within 24 hours of the procedure, using a single analgesic (acetaminophen) and a single antibiotic (cephalosporin). There was no infection or major complication through 30 days of follow-up.

## DISCUSSION

Appendectomy is the most common indication for emergency surgery in general surgery.

The advantages of the videolaparoscopic appendectomy have been widely reported during the last decade.

The so-called one trocar appendectomy, where the dissection of the appendix is performed inside the abdomen and, after that, it is exteriorized and extracted outside the abdominal cavity has been used especially in pediatric patients,<sup>3</sup> but also in adults.<sup>4,5</sup>

In 2007, Zhu<sup>6</sup> from China, reported his first experience using the umbilicus to access the peritoneal cavity, naming the procedure Transumbilical Endoscopic Surgery (TUES). He performed a liver cyst fenestration, abdominal exploration, and appendectomy. A standard flexible endoscope was introduced into a 12mm trocar and the operation was performed with the instruments through the working channels by the endoscope.

In 2008, Zhu<sup>7</sup> et al published another paper describing new TUES operations: two cases of liver cyst fenestrations, six cholecystectomies, and nine appendectomies, using a trichannel trocar. The appendix was extracted through the umbilicus and resected extracorporeally.

Also during 2008, Palanivelu et al<sup>8</sup> from India, described eight successful transumbilical endoscopic appendectomies, using a standard flexible endoscope. The authors considered this technique a precursor of NOTES.

In the past few years interest in new minimally invasive approaches has expanding rapidly in the scientific field globally. The SITRACC is one new option among devices in this area. The advantages of the single port surgery path are similar to NOTES, such as fast recovery and better cosmetics results (Figure 2), without the problems that the pure transluminal surgery brings, such as the difficulty in closing organs, intracavitary orientation, infections, and others.



*Figure 2 - Cosmetic result 7 days after the surgery.*

## CONCLUSION

In face of a new technology and/or a new approach we need to ask ourselves three questions:

Is it feasible?

Is it safe?

Is it worthwhile?

We can conclude that Appendectomy by Single Trocar Access is feasible and safe, representing an important option in the surgical arsenal. The third question can only be answered after new prospective comparative studies compare the new approach and the conventional laparoscopic procedures. This is a new technique and it needs to be further studied.

## RESUMO

**Objetivo:** Apresentar a experiência inicial de apendicectomia por videolaparoscopia pela via transumbilical, usando um sistema de portal único, chamado Single Trocar Access - SITRACC®. **Pacientes e Métodos:** De novembro de 2009 a julho de 2010 oito apendicectomias usando o SITRACC foram realizadas. A cirurgia consistiu na apendicectomia laparoscópica clássica, utilizando instrumentos especiais flexíveis e articulados. **Resultados:** O tempo cirúrgico médio foi de 38 minutos. Em nenhum dos casos foi necessário adicionar outro portal. Todos os pacientes tiveram alta até 24 horas após a cirurgia. Não houve complicações maiores durante a fase pós-operatória. **Discussão:** A apendicectomia pelo método de Acesso Trocarte Único é viável e segura. Com o aperfeiçoamento dos instrumentos e do trocarte multicanal, novas cirurgias poderão ser realizadas por esse método, acrescentando uma nova arma na luta contínua para beneficiar nossos pacientes.

**Palavras-chave:** Cirurgia Minimamente Invasiva, apendicectomia, Single Trocar Access.

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# Natural Orifice Surgery Terminology: An Effort to Develop Uniform NOTES Descriptions

## Terminologia Cirúrgica de Orifício Natural: Um Esforço para se desenvolver Terminologias NOTES Padronizadas

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### ABSTRACT

Contributions to the literature about the new field of natural orifice surgery have increased dramatically in recent years; a lack of standardization of terminology may confuse readers of clinical reports. Thus, a standard and uniform taxonomy is needed for natural orifice surgery. This will foster accuracy and uniformity in series and comparative studies. The Brazilian NOTES Research Group, and the NOTES Committee of the Brazilian Society of Laparoscopic Surgery (SOBRACIL), drawing from the clinical experience of its members, proposes a new terminology for future publications in the field.

**Key words:** Natural orifice surgery; NOTES terminology; Natural orifice endoscopic.

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Natural Orifice Transluminal Endoscopic Surgery (NOTES) is an evolving concept combining techniques of minimally invasive surgery with flexible endoscopy, potentially representing a major paradigm shift to scarless surgery. With the aim of avoiding incision-related complications, researchers make efforts to create even less invasive access by means of transluminal surgery. Since the first research was published in 2004,<sup>1</sup> and proceeding to human research conducted under ethics committee approval,<sup>2-27</sup> natural orifice surgery has been described without uniformity of terminology. Thus, some reports in the literature and conference proceedings do not represent strictly transluminal surgery. Similarly, umbilical surgery

has been sometimes classified as “NOTUS” instead of single port laparoscopy.

As publications in natural orifice surgery evolve, discrepancies about terminology may confuse readers of case and series reports. Thus, the adoption of a standard and uniform natural orifice surgery taxonomy is desirable for future publications, allowing accuracy and uniformity in series and comparative studies. The NOSCARGroup is finalizing a second White Paper on NOTES based on the last Meeting in San Francisco in July 2008, and will include an update of transluminal surgery terminology.

With the aim of clarifying the range of these exciting new developments, the Brazilian NOTES Research Group met in Rio de Janeiro in December

2008 to establish a consensus about terminology. The group recommended dividing the NOTES classification for procedures into four categories:

**(1) Totally NOTES (T-NOTES):** “Pure” NOTES using transluminal flexible or rigid tools without any percutaneous assistance or visualization);

**(2) Hybrid NOTES:** NOTES with mixed technologies using transabdominal instrumentation to facilitate the NOTES procedure, but still using some flexible or rigid tools through a natural orifice for the key parts of the procedure;

**(3) NOTES assisted Laparoscopy:** Laparoscopic surgeries in which only visualization is performed via a natural orifice, i.e. the camera is passed through a natural orifice. Examples include laparoscopic resection of a gastric tumor with endoscopic peroral visualization, or the use of a transvaginal camera for laparoscopic cholecystectomy. Its use has also been described by Tsin et al<sup>28-29</sup> for culdolaroscopy;

**(4) NOSE (Natural Orifice Specimen Extraction):** As proposed by Palanivelu et al,<sup>30</sup> refers to procedures in which the organ/tissue is extracted through a natural orifice after a standard laparoscopic procedure. See previous descriptions in laparoscopic surgeries.<sup>31-35</sup>

Umbilical surgery using different types of Single Port Access should be described as single-trocar laparoscopy, as there is a need for skin and fascia incision, providing postoperative somatic pain instead of visceral pain, and not avoiding incision related complications. The term “NOTUS” (“natu-

ral orifice trans-umbilical surgery) is inappropriate and should be abolished. The umbilicus is a natural scar, not an orifice, and umbilical laparoscopic surgery should be referred to as single access surgery, single port surgery, transumbilical endoscopic surgery (TUES), or laparoendoscopic single site surgery (LESS).<sup>36</sup>

Further classification concerns the use of flexible or rigid endoscopy and tools. As described by Buess et al, NOTES procedures can be divided into **FLEX-NOTES** (involving the use of flexible tools), or **RIG-NOTES** (NOTES using rigid tools only). These distinctions are already relevant for Transanal Endoscopic Microsurgery (TEM) procedures,<sup>37-39</sup> and for natural orifice cholecystectomy surgery using rigid instruments.

As future peer-reviewed publications may generate novel branches of this taxonomy, it will need to be reviewed, expanded and modified periodically.<sup>40</sup> Hopefully, the proposed terminology will promote uniformity needed for studies in this new field.

The future of clinical applications of transvaginal NOTES and its role in mainstream surgery require further research using **prospective** randomized controlled study designs to better understand the benefits and limitations when compared to laparoscopic surgery. The development and application of natural orifice surgery seems to be the next frontier for minimally invasive surgery, and should only be performed by a multidisciplinary team in Institutional Review Board (IRB)-approved studies after extensive experimental training.

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## RESUMO

As contribuições para a literatura sobre o novo campo da cirurgia por orifícios naturais têm aumentado dramaticamente nos últimos anos; a falta de padronização da terminologia pode confundir os leitores de casos clínicos. Assim, uma taxonomia padrão e uniforme é necessária para a cirurgia por orifícios naturais. Isso irá favorecer a precisão e uniformidade nas publicações de série de casos e estudos comparativos. O grupo brasileiro de pesquisa do NOTES e o Comitê de NOTES da Sociedade Brasileira de Cirurgia Laparoscópica (SOBRACIL), partindo da experiência clínica de seus membros, propõe uma nova terminologia para futuras publicações na área.

**Palavras chave:** Cirurgia por orifício natural; Terminologia; NOTES; Endoscopia por orifício natural.

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# Experience in Organizing a “Videosurgery Fishbowl” for Training Endoscopic Surgery at the 2007 and 2009 Congresses of the Brazilian Society of Endoscopic Surgery (SOBRACIL)

## Experiência com a Estruturação de um Local de Treinamento em Videocirurgia (“Aquário de Videocirurgia”) nos Congressos da Sociedade Brasileira de Videocirurgia (SOBRACIL) 2007 & 2009

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### ABSTRACT

**Introduction:** Videosurgery has introduced profound changes in contemporary surgery. In order to perform it, videosurgery requires a structured learning process that is relatively complex. The variety and complexity of the procedures that the surgeon must master makes continuing education in videosurgery a requirement. **Material and Methods:** The project was carried out at the Brazilian Videosurgery Congresses organized by SOBRACIL that took place in the cities of Bento Gonçalves, RS, in 2007 and in Belo Horizonte, MG, in 2009. The objective was to offer congress attendees a setting in which to develop their skills in basic and advanced techniques in videosurgery, and to offer contact with equipment and instrument of different companies. **Results:** In the 2007 SOBRACIL Congress, there were 248 participants (18% of the Congress registrants). No evaluation of the activities during 2009 SOBRACIL Congress was conducted. The participants' level of prior proficiency in videosurgery varied. **Discussion:** In conducting a training in videosurgery it is clear that one is learning or relearning some motor skills. These should be acquired by training or practice supervised by skilled and experienced professionals. Taking a course where the surgeon learns the basic precepts and tries out new knowledge should seem fundamental. **Conclusion:** The “Videosurgery Fishbowl” made possible an initial basic training that is effective and of high quality, providing real world but supervised contact with the specific equipment and instruments.

**Key words:** Videosurgery, videolaparoscopy, training and learning.

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### INTRODUCTION

The introduction of microcameras in the first half of the 1980s established the conditions for the videolaparoscopic era which is usually said to have begun in 1987 with the cholecystectomy performed by Philip Mouret in Lyon, France. Videolaparoscopy set itself apart as a clearly therapeutic modality, in contrast to laparoscopy that was essentially diagnostic. Since then, videolaparoscopy has expanded its range

of application, once limited to the abdominal cavity, but now applied to other parts of the human body. The great benefits of videolaparoscopy have been demonstrated, gradually expanding its indications, reaching beyond general surgery and the digestive tract, into other surgical specialties.

Videosurgery has introduced profound changes in contemporary surgery, and is now considered the “gold standard” for many surgical procedures. Technological advances, with



repercussions on the quality and on the variety of equipment and instruments, as well as improvements of surgical technique have led to a very rapid evolution of method, which has become highly specialized. Thus, in order for one to be able to perform these procedures, videosurgery requires a learning process that is well structured and relatively complex in character.

The variety and complexity of surgical procedures that the surgeon must currently master dictates a need for continuing education in videosurgery. The training of the surgeon in the method should be similar to the training of the surgeon in open surgery; i.e., in a service with a training system along the lines of a Medical Residency Program, taking into account specific pedagogic differences. Thus, ideally training in videosurgery should be done in stages, gradually and progressively in regard to the complexity of procedures, and under supervision and mentoring of a qualified professional. This should occur in a service with significant case volume involving the videosurgical techniques; the period of training should be sufficient to gain proficiency, and thus, obviously, extended.

In Brazil, videosurgery instruction is lacking both in medical school and in post-graduate medical training, including residency programs. These, when they have training in videosurgery, in general do not adequately and fully train the surgeon to carry out videosurgery. There exist, however, some centers of excellence in training in videosurgery, the majority not affiliated with institutions of higher education.

It is in this context that we proposed including an "express" training within the Congresses of the Brazilian Society of Videosurgery (SOBRACIL), using only "in vitro" simulation capabilities, as a way to demonstrate and to encourage congress attendees to pursue continuing education in videosurgery. Modeled on the experience developed at the Annual Meetings of the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES), the project grew out of a partnership and support developed among SOBRACIL, Training Centers engaged for several years in training in videolaparoscopic surgery (CETREX in Brasilia, DF and the Extension Course in Videolaparoscopic Surgery, Hospital Parque Belém [Bethlehem Park Hospital] in Porto Alegre, RS), and companies representing equipment and instrument manufacturers. Two introductory courses in videolaparoscopic surgery have already taken place

during the last two scientific meetings of SOBRACIL in Bento Gonçalves, RS in 2007 and in Belo Horizonte, MG, Brazil in 2009. Both were blockbuster successes with congress attendees and the partner companies.

The project creates an environment in an enclosed area, but with large windows through which the congress attendees may observe their colleagues enrolled in the training going through the exercises. Because of the visibility and unusual nature of the project, it was christened with the name "Videosurgery Fishbowl". (Figures 1, 2 and 3)

The project makes available to physicians, residents and medical students a program that contributes to a better preparation for professional practice in this area of knowledge, particularly by encouraging the professional to seek a proper training in videolaparoscopic surgery.

## MATERIALS AND METHODS

The project was implemented and refined at the Biannual Scientific Meeting (Congresses) of the Brazilian Society of the Videosurgery (SOBRACIL – Sociedade Brasileira de Cirurgia Laparoscópica) held in the cities of Bento Gonçalves, Rio Grande do Sul in 2007, and in Belo Horizonte, Minas Gerais in 2009. The training activities were conducted throughout the entire duration of the congress at no additional charge to meeting attendees who – due to the anticipated popularity – were merely asked to sign up in advance.

The goal of the project was to give meeting attendees a setting in which to practice basic and advanced techniques in laparoscopic surgery, useful in their day to day surgery. Moreover, with the supply of equipment and instruments by different companies, an ideal environment was created for both the exhibition of vendor's products and for participants registered for the course to evaluate them. The architectural layout proposed and developed for the training room in Bento Gonçalves in 2007 (Figures 4, 5 and 6) placed all the training stations, and therefore, the students, teachers and company representatives in one environment (which was referred to as the "Videosurgery Fishbowl"), with the equipment (racks) side by side. Adjacent to training facility was office space for a course secretary and a storage area for perishable material (pieces of pig liver, stomach and intestine). The training room also area an area for small lecture area with a projector).



**Figure 1** – activity in the “Videosurgery Fishbowl” 2007 SOBRACIL Congress.



**Figure 2** – activity in the “Videosurgery Fishbowl” 2007 SOBRACIL Congress.



**Figure 3** – activity in the “Videosurgery Fishbowl” at the 2007 SOBRACIL Congress.

In the case of the Congress held in Belo Horizonte in 2009, for reason related to the venue, equipment (racks) of the different companies has to be place in separate environments (various “Fishbowls”), also called

training stations. This spread out the training, and made the each station quieter and made it somewhat for the representatives of the exhibiting companies to exhibit and explain their products.

Pairs of students performed the exercises together alternating the role of surgeon and camera operator. Each of the five training stations had specific tasks to be performed, reflecting the type of equipment and instruments on display. Participants were given 10 minutes to perform the tasks at each station. Each pair was expected to have passed through the five stations and experienced the various activities and handled the equipment and instruments in approximately one hour. Each station had two racks with identical equipment and instruments, allowing the simultaneous passage of two pairs of students per station. Thus, twenty students – four per station – went through the Fishbowl hourly. At each training station there was at least one surgeon preceptor, and representatives of exhibiting companies. Equipment and instruments featuring new technological advances that did not conform to the proposed exercises at first four stations were demonstrated at the fifth station where their novel capabilities could be showcased.

The “Fishbowl” was also the setting for an Introduction to Videosurgery Course for medical students and a Knot and Sutures Course held during the 2007 SOBRACIL Congress in Bento Gonçalves, both with specific programming.

At both congresses, these Videosurgery Fishbowl functioned for four days with one or two four hour sessions per day. The course was open and free to anyone attending the Congress but required advance registration. The capacity of the “Fishbowl” was 80 students per shift (20 per hour), or 480 students in six four-hour sessions.

## **EXERCISES DEVELOPED for the training stations (“Videosurgery Fishbowl”)**

### **1. ENERGY SOURCES**

**CONCEPT:** To compare different energy sources for use in laparoscopic surgery.

**OBJECTIVE:** To use different forms of energy to cut and coagulate tissue in the videosurgery environment.

### **2. BASIC VIDEOSURGERY EXERCISES**

**OBJECTIVE:** initial adaptation to working in a two dimensions with a monitor, grip training, laterality

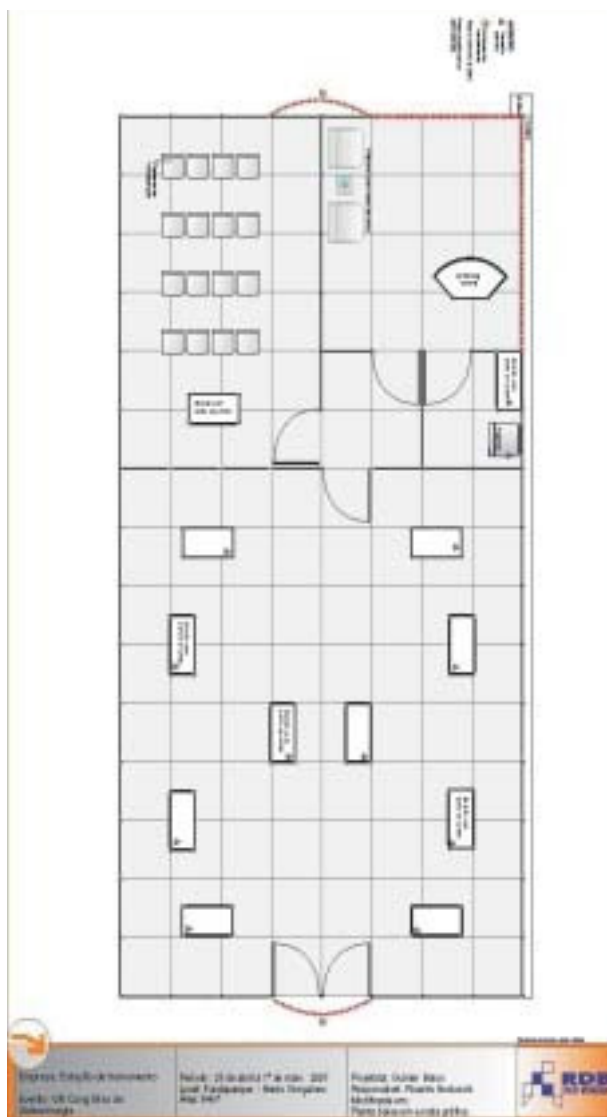


Figure 4 – architectural design for the “Videosurgery Fishbowl” of the 2007 SOBRACIL Congress.



Figure 5 – architectural design for the “Videosurgery Fishbowl” of the 2007 SOBRACIL Congress.

and depth with emphasis on working simultaneously with both hands.

**DESCRIPTION:** sequence of exercises based on the “Top Gun” method described by ROSSER<sup>1,2</sup>

1. “Cobra Rope Drill”
2. “Pea Drop Drill”
3. “Terrible Triangle Drill”

### 3. ENDOSCOPIC KNOT

**OBJECTIVE:** training in intracorporeal surgical knots and stitches

**DESCRIPTION:** intracorporeal knot-tying.

### 4. ENDOSCOPIC SUTURE

**CONCEPT:** training the steps of an endoscopic suturing

**OBJECTIVE:** placement of suture needle into the cavity and to suture with simple intracorporeal and knots.

### 5. ENDOSCOPIC ANASTOMOSIS

**CONCEPT:** handle endostapler and achieve tissue approximation of porcine viscera using intracorporeal suturing and knot-tying.

**OBJECTIVE:** perform opening, position the endostapler adjusting its jaws, and achieve tissue approximation by intracorporeal suturing and knot-tying in porcine intestine or stomach.

## EQUIPMENT AND INSTRUMENTS

Composition of each video rack (total: 10 racks):

- 01 Video Monitor
- 01 Micro-Camera

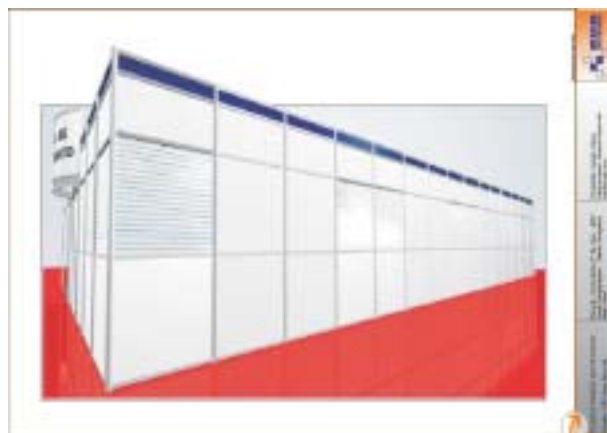


Figure 6 – architectural design for the “Videosurgery Fishbowl” of the 2007 SOBRACIL Congress – lateral perspective.

- 01 “Black box” with its own light source
  - 01 0° or 30° optic
- Basic Instruments for each rack:
- 01 5 mm dissection (Maryland) forceps
  - 01 5 mm gripping forceps without ratchet
  - 01 Needle holder
  - 01 counter needle holder
  - 01 5 mm curved scissors
  - 01 10 mm by 5 mm metal reducer
  - Trocars for the “black box” (if needed – two 10 mm and one 5 mm)
- Training Stations:
- Styrofoam Base
  - Needles
  - Scissors
  - Pig organ (stomach, liver and intestines) and synthetic models that adapt to training specialties.

The organization of the first Videosurgery Fishbowl at the 2007 Congress involved the leadership of both the National SOBRACIL society and the Rio Grande do Sul chapter, with Dr. Carlos F. Dillenburg serving as course coordinator. For the 2009 Congress, the organization was performed by CETREX (Brasília, Brazil) in partnership with the Extension Course in Laparoscopic Surgery Video of the Parque Belém (Bethlehem Park) Hospital (Porto Alegre, RS). In the second edition, the idea was to homogenize the educational process of the “Fishbowl” by using centers (organizations) dedicated to training in laparoscopic surgery. In 2009, the project coordinators were Dr. Elias Almeida Couto Filho (Brasília, Brazil) and Dr. Miguel Prestes Nácul (Porto Alegre).

The corps of instructors was composed of surgeons skilled in laparoscopic surgery, with current teaching activity in laparoscopic training courses at the post-graduate level, assisted by residents from General Surgery services. Preceptors underwent a pre-course training in order to explain the teaching methodology being applied.

## RESULTS

At the 2007 SOBRACIL Congress, 248 participants (18% of registrants of the Congress) availed themselves of the Videosurgery Fishbowl. 44% were medical students, 41% general surgeons, 8% gynecologists, 4% urologists, 1% gastroenterologists, 1% plastic surgeons and 1% proctologists. 15% of the participants said the activity exceeded their expectations, 68% said their expectations were fully

met, and for 18% said their expectations were partially met. No evaluation of the training at the 2009 SOBRACIL Congress was conducted.

The level of prior proficiency in videosurgery among those who participated was varied, ranging from students with no prior training to surgeons certified in videosurgery with experience in high complexity procedures. The principal vendors of laparoscopic surgery equipment in Brazil: H. Strattner, Karl Storz, Olympus, Stryker, Partners, Taimina, Johnson & Johnson, Covidien, Edlo, Bhio Supply and Support participated in the project. Listen

## DISCUSSION

The area of greatest focus in learning videosurgery is, without doubt, the psychomotor domain, which is related to doing (physical actions and movement).

“Motor learning” studies the mechanisms and processes underlying changes in motor behavior due to practice (training), from a state in which one does not dominate a skill until one is able to perform with proficiency as a result of a period of practice, a situation known as the learning curve.<sup>4</sup> Learning curves reflect a process of learning by doing. The basic idea of the learning curve is that, in the course of repeating a task, the time it takes to perform the task gradually decreases due to mastering of the skill. The learning curve, therefore, can be defined as a graphic expression of the period required to incorporate new knowledge. In practice, the criteria that have been used to define a learning curve is the time needed to perform a procedure and the number of procedures that the average surgeon needs to be able to perform the procedure independently with a reasonable outcome. Listen

In training in videosurgery it is clear that one is learning or relearning some motor skills.<sup>3</sup> These motor skills should be acquired by training or practice with the ultimate aim of achieving proficiency. Starting from movements guided by two-dimensional viewing they will reach a new order and consistency eventually becoming automatic. Listen

The learning process should be done in stages; it is obviously necessary to first become familiarized with and learn how to manipulate the videosurgery equipment and instruments. It is also necessary to adapt to changes related to vision and psychomotor skills required to operate in the laparoscopic environment, where one has to work with images

projected on a screen with a two-dimensional view, using long instruments that pass through fixed points. Psychomotor adaptation to this new work environment can be facilitated by various types of training. By requiring the movement be viewed in the operative field through a video screen, it is clear that the environment to be manipulated in videosurgery, with indirect visualization of the operative, is entirely different from that experienced by conventional or open surgery.<sup>8</sup> ListenRead phoneticall

For the novice approaching videosurgery, taking a course where the surgeon learns the basic precepts and tries out new knowledge should seem fundamental. Unquestionably, courses conducted using animals serve to reduce the learning curve in real surgical cases. As most of these courses are of short duration, additional training is recommended to develop more complex skills such as suturing. In addition, the first videosurgery procedures should be accompanied by a mentor.

Simulation using virtual reality, beside reducing the learning curve, have the proven ability to objectively evaluate the skills of surgeons.<sup>6</sup> The use of simulators is interesting of the growing ability to configure virtual situations similar to surgical procedures which increasing incorporate tactile sensation.<sup>6</sup> However, perhaps the greatest contribution of this type of equipment is the ability to assess, quantifying distinct levels of skill according to the surgeon's ability to execute surgeries of varying degrees of complexity.

Thus, training in videosurgery using a combination of synthetic models, experimental animals, and simulators in an organized program of instruction of varying duration have shortened the learning curve, making the apprentice videosurgeon less vulnerable to having complications or litigation during the learning process. Attaining a level of proficiency should minimize postoperative complications.

The experience of applying the "Top Gun" teaching methods<sup>9</sup> at the annual meetings of SAGES and the American College of Surgeons (ACS) in recent years revealed an interesting opportunity to merge the interests of medical societies organizing videosurgery congresses, congress attendees, and equipment companies to generate a structure that allows congress attendees to use equipment and instruments in a systematic manner, performing tasks with instructional validation in videosurgery.

Colleagues who attended international meetings, brought this experience Brazil and developed for the 1st

South Brazilian Videosurgery Congress in 2006 in Gramado, RS a Knots and Sutures course which was conducted in one of the rooms of the congress. The event was very successful both from the standpoint of the interest by congress attendees – requiring the opening of another class at the same conference – as well as the structural, organizational and pedagogical quality of the event. From this experience emerged the idea of establishing a true "Training Center" in the exhibition area of the Brazilian Videosurgery Congress held in Bento Gonçalves in 2007.

The proposed objectives were: to provide knowledge about methods of training in videosurgery and about videosurgery equipment and instruments, arouse interest in the method, and to develop or enhance videosurgery skills. The project's success led to its repetition during the next SOBRACIL Brazilian Congress of Videosurgery, held in Belo Horizonte in 2009. The idea of this project is to consolidate a course structure and an instructional method that can be applied at various events with customization appropriate for different surgical subspecialties.

The sequence of training stations allows students to use the equipment under the guidance of preceptors with support provided by representatives of the exhibiting companies, who can provide relevant technical information about the products being used. The use of separate environments at the 2009 congress afforded students, tutors and companies at somewhat quieter setting in which to perform the activities. The training stations should, however, remain close to each other in order to preserve the real concept of the "Training Center". It is also important to situate the Training Center in the center of the exhibition fair, because it enhances the visibility of the project generating greater interest.

It is very important to apply technical concepts and a consistent instructional method which directly depends on good organization, preceptors who are engaged and competent, and active participation of the companies. The "Fishbowl" offers a space to observe the operation of equipment in real situations. It is therefore critical that companies not only provide their equipment and vehicles, but also that their representatives provide technical data and guide its proper use.

The idea of conducting comparative proficiency exercises among students with prizes/awards can heighten interest and increase traffic in the Training Center. Such competition is, in fact, one of the central concepts of the "Top Gun" method.

However, it is likely that such “exercises of confrontation”, for example, assembling a puzzle or “the ultimate knot” task have more entertainment value than real educational impact. However, the playful side of the exercise should always be valued and tends to increase the interest of those attending the meeting. The evaluation of time required to complete each task and the number of errors can be used generate comparative scores. In neither of the congresses was the assessment of student performance according to the Because of the nature of the event and because any evaluation of the students have added to the complexity what the preceptors needed to do no evaluation of student performances was conducted at either the two congresses.

Having the student work in pairs is intended to mimic the real life videosurgery. The manipulation of the different videocameras with frontal (0°) and lateral (30°) view optics was designed to train navigation. The training time for each exercise – five minutes per individual and ten minutes per pair – was considered too brief by some students, but the intent was to offer the activity to the greatest number of participants.

The decision to outsource the instructional planning and execution of the project to Videosurgery Training Centers reflected a desire to have an appropriate and uniform instructional and training process using validated methods that were capable of delivering results and foster greater interest in training.

## CONCLUSION

The project of developing a training place in the SOBRACIL Congress (“Videosurgery

Fishbowl”) seeks to embrace the experimental element inherent in videosurgery, creating an structured alternative in the form of training modules (stations), filling an existing educational gap at scientific meetings. Providing real world but supervised contact with the specific equipment and instruments, allows both the preceptor and the manufacturer (or their representative) to present their perspectives on the products.

With a team of professionals renowned in their fields, complete infrastructure, cutting edge technology, and a pedagogical approach in tune with global trends, the “Videosurgery Fishbowl” made possible an initial basic training that is effective and of high quality. It is clear that the main function of the course is to introduce videosurgery training both in relation to the initial development of specific skills as well as a metacognitive awareness derived by the training, encouraging the surgeon to seek appropriate opportunities to promote the safe and scientifically based practice of videosurgery. The ultimate goal of this teaching project is to disseminate the knowledge of videosurgery, promoting it the ongoing evolution and maintaining the highest standard of quality in surgery.

## ACKNOWLEDGEMENTS

We thank the corps of preceptors who worked at 2007 SOBRACIL Congress and the 2009 SOBRACIL Congress, without whom it would have been impossible to conduct training that was competent and individualized. Our special thanks to Mr. Marcelo Pauli and Mr. Alexander Mango Stanislaus for their key role in organizing the activity.

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## RESUMO

**Introdução:** A videocirurgia introduziu profundas mudanças na cirurgia contemporânea. Para que se possa exercê-la, a videocirurgia requer um processo de aprendizado estruturado e de caráter relativamente complexo. A variedade e complexidade de procedimentos que o cirurgião deve dominar determinam a necessidade de uma educação continuada em videocirurgia. **Material e Métodos:** O projeto foi realizado nos Congressos Brasileiros de Videocirurgia da SOBRACIL realizados nas cidades de Bento Gonçalves, RS, em 2007 e em Belo Horizonte, MG, em 2009. O objetivo foi proporcionar aos congressistas um local de desenvolvimento prático de técnicas básicas e avançadas em videocirurgia, e de oferecer a oportunidade de contato com produtos e instrumentais de diferentes empresas. **Resultados:** No Congresso da SOBRACIL de 2007, houve 248 participantes (18% dos inscritos no Congresso). Não foi realizada avaliação da atividade durante o Congresso da SOBRACIL de 2009. O nível de proficiência prévia em videocirurgia dos inscritos foi variado. **Discussão:** Ao se realizar um treinamento em videocirurgia fica clara a necessidade da aprendizagem ou reaprendizagem de algumas habilidades motoras. Essas devem ser adquiridas pelo treinamento ou prática orientada por profissionais habilitados e experientes, parecendo fundamental a realização de curso onde o cirurgião aprenda os fundamentos e exercite os novos conhecimentos. **Conclusão:** O “aquário de videocirurgia” possibilitou um treinamento básico inicial efetivo e de boa qualidade, proporcionando um contato real e orientado com o equipamento e instrumental específico.

**Palavras-chave:** Videocirurgia, videolaparoscopia, treinamento e aprendizagem.

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# Laparoscopic Distal Pancreatectomy with Spleen Preservation in a Patient with a Pancreatic Cystadenoma. Case Report

## Pancreatectomia Distal Laparoscópica com Preservação do Baço em um Paciente com Cistoadenoma de Pâncreas. Relato de Caso

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### ABSTRACT

With the technological advances and increased experience with laparoscopy, increasingly complex procedures are being performed laparoscopically. Pancreatic resections accompanied this evolution and are possible in centers with great experience. Due to its low incidence and surgical complexity, there is no standardization of the procedure, including spleen preservation. We present a case report of a patient with cystadenoma in the body of the pancreas who underwent laparoscopic resection with preservation of the spleen. The procedure was performed using six laparoscopic portals. The duration of surgery was 180 minutes. There were no intraoperative complications, and no need for transfusion of red blood cells or other blood components. The patient developed a pancreatic fistula on the third post-operative day; with conservative treatment there was clinical resolution. The patient stayed in the intensive care unit for 24 hours and in the hospital for six days. In this case, laparoscopic distal pancreatectomy with spleen preservation was shown to be safe and effective, requiring a short hospitalization.

**Key words:** Pancreatic resections; laparoscopy.

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### INTRODUCTION

Laparoscopic surgery represents an important technological advance in surgical procedures. New techniques, new equipment, and experience accumulated over several decades has allowed for increasingly complex surgeries to be performed laparoscopically.<sup>1,2</sup> The early use of laparoscopy in pancreatic pathologies was limited to neoplasm staging, pseudocyst drainage, and palliative oncologic treatments.<sup>1,3-6</sup> The first pancreatic resections were performed in the late 1990s,<sup>6</sup> and, since then, distal pancreatectomy has been more often utilized for benign tumors in the body and tail of the pancreas. There are still few reports of this procedure in the literature, even from large centers, due to the low incidence of these pathologies and the surgical complexity; there is no standardization for the procedure.<sup>1,3,5,7-9</sup>

The advantage of this approach, in relation to laparotomy, are the benefits of a minimally invasive surgery, shorter hospitalizations, less post-operation pain, and faster recovery.<sup>2,4-7,10</sup> Nevertheless, spleen preservation is still being discussed.<sup>1,4,7</sup>

The goal of this work is to report the case of a patient with pancreatic cystadenoma who underwent laparoscopic distal pancreatectomy with spleen preservation.

### CASE REPORT

The patient is a 55 years old male, with a one year history of a post-prandial sensation of “being stuffed”, accentuated after eating fatty foods, without other associated complaints. The patient underwent diagnostic investigation with ultrasonography, which demonstrated cholelithiasis and a solid pancreatic



node; computed tomography of the abdomen revealing a hypoeogenic node in the pancreas measuring 1.5 cm x 1.5 cm in the transition between the head and the body; and nuclear magnetic resonance showing a cystic formation of approximately 1.8 cm in the body of the pancreas without alteration of the Wirsung duct. (Figure 1)

The patient underwent distal pancreatectomy with spleen preservation, under general anesthesia, in a modified lithotomy position. prophylactic antibiotic was administered during the anesthetic induction. The surgeon positioned himself between the legs of the patient with the first assistant at his right and the camera-assistant at his left; the monitor was placed on a bedside table on the patient's left side.

Six portals were used: one 10 mm umbilical portal, one 12 mm left side portal, four 5 mm portals in the epigastrium, left hypochondrium, left iliac fosse, and right side (Figure 2). The intra-abdominal pressure was monitored and maintained at levels below 14 mm Hg. A 30-degree laparoscopic optic was used.

The procedure was initiated with the opening of the mesocolon using a harmonic scalpel (Ultracision, Ethicon Endo Surgery, Cincinnati, OH, USA) with visualization of the body and tail of the pancreas. A careful blunt dissection of the inferior border of the pancreas was performed, with access to its posterior face and view of the splenic vein. A pancreatic transection between the pancreas and the splenic vessels was conducted with a 45 mm linear stapler (Ethicon Endo Surgery, Cincinnati, OH, USA). Titanium clips and a harmonic scalpel were used for hemostasis. The dissection was continued up to the splenic hilum, with complete liberation of the piece. The exeresis of the pancreas was conducted using a bag, with expansion of the umbilical portal incision. A number 19 Jackson-Prates drain was inserted to monitor the pancreatic stump. The duration of surgery was 180 minutes, with blood loss estimated at 250 ml, without the need for transfusion of red blood cells or blood components. The patient was sent to the intensive care unit, where he remained for 24 hours. A liquid diet initiated on the first post-operation day was well tolerated. Despite drainage of less than 50 ml/day, the amylase measurements of the drain fluid on post-operation day 2 was 907 U/L. Oral intake was suspended and octreotide administration was initiated. There was a reduction of this value to normal levels in 24 hours, with a decrease of the drain's production to 10 ml/24 h. The oral diet was



Figure 1 - Magnetic Resonance Image.

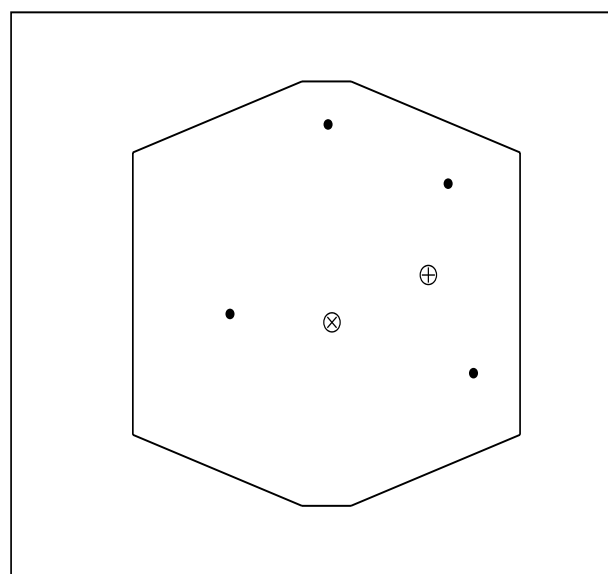


Figure 2 - Scheme of laparoscopic portals.

- : 5 mm
- ⊗ : 10 mm
- ⊕ : 12 mm

reintroduced and the drain was removed. Octreotide was used for 48 hours. The patient was discharged on post-op day 6, without further complications.

## DISCUSSION

Laparotomic distal pancreatectomy normally, requires large incisions for optimal exposure of the cavity due to the location of the pancreas and its relationship to large vessels. This is reflected post-

operatively in greater pain, greater probability of ileum, and longer length of stay as compared with less invasive surgery.<sup>1,2,4-7,10</sup>

Laparoscopic distal pancreatectomy is a procedure with indices comparable to conventional surgery. Published series in the literature show no statistically significant difference in the duration of surgery or in the incidence of complications, particularly pancreatic fistula.<sup>5,6</sup> Despite the degree of technical difficulty, the authors consider this procedure safe in centers with experience in laparoscopic surgery.<sup>2-5,11</sup>

The laparoscopic procedure is best indicated for patients with benign lesions in the body and tail of the pancreas, due to the favorable distal location for resection, and because such cases do not require anastomosis or lymphadenectomy.<sup>1,3,9</sup>

In the literature, the most frequently used surgical technique for distal tumors is distal pancreatectomy with removal of a block of the spleen.<sup>4</sup> There is no consensus regarding the preservation of the spleen, though it is defended by several authors mainly because of concerns about post-operative infectious complications.<sup>1,4,7</sup> This procedure can be performed using splenic vessel occlusion with blood supply maintained by the short vessels (Warshaw's technique) or with their preservation. We believe that distal pancreatectomy should always be conducted with

splenic preservation without sectioning splenic vessels when such vessels are not affected, due to complications associated with Warshaw's technique, such as abscesses and splenic infarcts.<sup>1,4</sup>

Pancreatic fistula remain one of the main complications of distal pancreatectomy, even when performed laparoscopically.<sup>6,10</sup> Vezakis *et al*<sup>7</sup> refer to improvements in their results after adopting routine suture of the post-stapled pancreatic stump. There is no consensus or uniformity about the definitions of fistula and pancreatic leaking in the literature.<sup>1,6,10</sup> We consider a pancreatic fistula to be present when the measured drain amylase is three times the highest normal serum amylase value. We treat pancreatic fistula in a conservative manner, reserving invasive procedures in case of clinical repercussion. We always use octreotide, despite controversy regarding its use.<sup>1</sup> In this particular case, we agree that there was a leak, as there was a dramatic decrease in the amylase levels and a decrease of the drain's output.

## CONCLUSION

In this case, laparoscopic distal pancreatectomy with spleen preservation was shown to be safe and effective, with results comparable to those previously published.

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## RESUMO

Com os avanços tecnológicos e maior experiência com a laparoscopia, procedimentos cada vez mais complexos estão sendo realizados por laparoscopia. As ressecções pancreáticas acompanharão esta evolução e são possíveis de serem realizadas em centros com grande experiência. Devido à sua baixa incidência e complexidade cirúrgica, não há padronização do procedimento, incluindo a preservação do baço. Nós apresentamos relato de caso de uma paciente com cistoadenoma no corpo do pâncreas que foi submetida à ressecção laparoscópica com preservação do baço. O procedimento foi realizado com seis portais laparoscópicos. A duração da cirurgia foi de 180 minutos. Não houve complicações intra-operatórias, e não houve necessidade de transfusão de sangue ou de outros componentes do sangue. O paciente evoluiu com fístula pancreática no terceiro dia pós-operatório, tendo resolução clínica com o tratamento conservador. O paciente permaneceu na unidade de terapia intensiva por 24 horas e no hospital por seis dias. Neste caso, a pancreatectomia distal laparoscópica com preservação do baço mostrou ser segura e eficaz, necessitando uma hospitalização de curta duração.

**Palavras-chave:** Ressecção pancreática; Laparoscopia.

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# Fluid Overload after Hysteroscopic Polypectomy

## Intoxicação Hídrica após Polipectomia Histeroscópica

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### ABSTRACT

This purpose of reporting this case is to show that we must be attentive with any type of hysteroscopic surgery, since all are subject to complications which can lead to permanent injury and even death. The case described is that of a 72 year old woman who underwent a diagnostic hysteroscopy for endometrial thickening. During the procedure, the presence of a fundic endometrial polyp occupying the entire cavity was noted. The patient then underwent surgical hysteroscopy for polypectomy. Twenty minutes into the procedure, with six liters of glycine infused, the patient developed fluid overload and the procedure was suspended. The patient received fluid support and electrolyte replacement, and in 48 hours was discharged in good condition. This case illustrates a complication of hysteroscopy. Complications of hysteroscopy are rare, especially for polypectomy with rates of about 0.4%. Complications that can be cited include uterine perforation, infection, hemorrhage, injury to adjacent organs, trauma to the cervix, embolism, and fluid overload. Fluid overload usually occurs with major hysteroscopy surgeries such as myomectomy and endometrial ablation. This type of complication is rare in hysteroscopic polypectomy.

**Key words:** Fluid overload, hysteroscopy, polypectomy.

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### INTRODUCTION

**I**ncreasingly hysteroscopy has an important role in minimally invasive treatment of patients with intra-uterine disease. The main indications for hysteroscopy are the removal of endocervical and endometrial polyps and fibroids, resection of uterine septum, endometrial ablation, and lysis of intrauterine adhesions (IUA), as well as its immense value in the evaluation of abnormal uterine bleeding and infertility.<sup>1</sup>

Hysteroscopic surgery has proven safe and has distinguished itself by the speed with which patients return to their regular activities. The literature has shown that complications of hysteroscopic surgery are infrequent and rarely serious. The main types of complications include uterine perforation, hemorrhage, infection (endometritis), injury to adjacent organs (bladder, intestine), and fluid overload from the distension medium, which has the greatest potential to become more severe and cause irreversible damage.<sup>2</sup>

The complication associated with distension media, although rare, is serious and can even lead to a patient's death. The main distention media are glycine, sorbitol, mannitol and distilled water. Excessive absorption of fluid and its metabolism can lead to the release of free water that can set off processes leading to pulmonary edema, ascites, cerebral edema, and even death.<sup>3</sup> One of the ways found to control the amount of liquid absorbed by the patient is the assessment of the difference between the amount of medium that is being infused during the procedure and the amount that is being absorbed. Some authors describe that this deficit should not exceed 1500 ml to avoid fluid overload.<sup>4</sup>

The initial clinical symptoms of excessive absorption of distension medium are nausea, vomiting, headache, and motor agitation. If not promptly and adequately treated, the patient may develop pulmonary and cerebral edema and even death. Therefore it is of utmost importance that both the surgical team and the anesthetic team are constantly communicating,

because if the patient begins to manifest such symptoms the procedure should be interrupted immediately, and appropriate treatment started, and monitoring of the patient intensified.<sup>5,6</sup>

This presentation of fluid overload from distention media most commonly occurs in hysteroscopic surgeries such as myomectomy, endometrial ablation and lysis of intrauterine adhesions. With polypectomies, the risk of this type of complication is very small (0.38%).<sup>2</sup> Nevertheless, we describe a case of a patient who developed a clinical picture of fluid overload during a polypectomy.

## CASE REPORT

This 72 year old multiparous (G2) white female, whose menopause began 16 years ago, has been taking tamoxifen for four years for a breast adenocarcinoma. In the course of routine follow-up for the breast cancer, she underwent a pelvic ultrasound that revealed endometrial thickening (endometrial lining 17 mm). The patient was asymptomatic and underwent a diagnostic hysteroscopy.

In our service diagnostic hysteroscopy is performed without anesthesia, using a 4mm Storz optic, with the intrauterine cavity distended with carbon dioxide gas through the Storz insufflator with pressures ranging from 80 to 100 mmHg. This examination, performed in August 2008, revealed a 1 cm endocervical polyp and a 5 cm fundic pedunculated endometrial polyp, without alteration of the vascularization on its surface, which completely occupied the uterine cavity. An endometrial biopsy was not collected during this exam.

Preoperative laboratory tests were order in anticipation of a surgical hysteroscopy for polypectomy. While awaiting scheduling of her surgery, the patient experienced mild vaginal bleeding in February 2009.

In March 2009, the patient underwent surgical hysteroscopy. During the procedure a fundic 5cm pedunculated endometrial polyp occupying the entire uterine cavity was visualized. Hysteroscopy for polypectomy was performed with the patient under spinal anesthesia as is standard in our service.

Twenty minutes into the procedure, the patient developed vomiting, malaise associated with increased blood pressure, tachycardia, and motor agitation. Close

to six liters of intrauterine glycine has been administered and the vacuum container had about 5 liters. The patient, thus, had absorbed one liter of glycine. The procedure was discontinued after the onset of symptoms. About 80% of the polyp had been removed.

The patient received fluid support and electrolyte replacement; her symptoms were treated with anti-emetics and diuretics.

Six hours after the procedure the patient underwent pelvic ultrasound that revealed a large quantity of free fluid in the pelvic cavity, and surrounding the kidney, liver, and spleen. The uterus was anteversoflexed, measured 76 x 36 x 48mm, and had an endometrial lining of 10 mm. Tests showed a sodium of 134 mEq/L, potassium 3.6 mEq/L, urea 36 mg/dL, and a creatinine of 0.62 mg/dL; urine output was 200 ml. Blood pressure was 140/90 mmHg and heart rate 86 bpm.

The patient was kept fasting, at rest, and received replenishment of sodium and furosemide over 24 hours. After this period the patient still had mild nausea, but no signs of edema; her blood pressure and heart rate were normal. Laboratory tests showed sodium of 139 mEq/L, potassium 3.8 mEq/L, urea 17 mg/dL, and a creatinine of 0.63 mg/dL.

She was discharged 48 hours after the procedure in good condition, without any electrolyte disturbance or symptoms.

Two weeks after the procedure, laboratory tests were sodium 141 mEq/L, urea 39 mg/dL, creatinine 0.65 mg/dL, and a potassium of 3.7 mEq/L. Pelvic ultrasound revealed a uterus anteversoflexed measuring 67 x 35 x 54mm with a volume of 56 mm<sup>3</sup> and an endometrial lining measuring 17 mm, with normal ovaries.

Anatomic pathology revealed a polyp in the endometrial mucosa with areas of atrophy and atypical complex hyperplasia. With this finding the patient underwent total abdominal hysterectomy. Anatomic pathology reported senile cystic atrophy of the endometrial, a Naboth cyst, endometrial hyperplasia, atrophic ovaries and fallopian tubes, and an absence of neoplasia.

## DISCUSSION

Complications of hysteroscopy are relatively rare events. They usually occur in surgical hysteroscopies at rates ranging from 3% to 24%.<sup>7</sup>

Complications of hysteroscopy include uterine perforation, infection, hemorrhage, pulmonary edema, fluid overload, electrolyte imbalance, encephalopathy, cerebral edema, air embolism, visceral lesions, sciatic nerve injury, dissemination of endometrial cancer, cervical trauma, complications of pregnancy, and death.<sup>7</sup>

To avoid many of these complications several authors recommend that one perform 250 diagnostic hysteroscopies before surgical procedures, and that these occur gradually, that is from the simplest to the most complex.<sup>8</sup> In this case, the surgery was performed by a third-year resident who has little experience in hysteroscopic surgery, even though it was supervised by a physician with surgical skill.

Fluid overload was described by GOLDRATH in 1986 when he noted that women who were undergoing hysteroscopy would present with swelling of the face, increased diuresis, and even pulmonary edema. These signs were similar to those presented by men who underwent laparoscopic resection of the prostate with liquid distention media.<sup>8</sup>

The overload, although rare, can progress to pulmonary edema. It is believed that the absorption of distention media occurs through three mechanisms: tubal passage and peritoneal absorption (extravascular), arterial or venous absorption (intravascular), and massive transit through uterine perforations.<sup>8</sup>

When there is excessive absorption of electrolyte-free liquids, hyponatremia, hypokalemia, and hypoosmolarity are generated. This can lead to mild symptoms such as headache, nausea, vomiting and lethargy and serious symptoms such as cardiac arrhythmia, transient blindness, cerebral edema, cerebral herniation, and death. Fluid overload occurs in 1-4% of surgical hysteroscopy.<sup>7</sup>

In a study in Norway with 800 women from 54 hospitals, fluid overload occurred in 5.2%, with absorption of one to two liters of distention medium, and death from fluid overload occurred in 0.1%. This complication occurs more frequently in endometrial ablations and myomectomies.<sup>9</sup>

PROPST and cols.<sup>10</sup> reported a complication rate of 2.7% in 925 hysteroscopic surgeries. The most frequent complication was fluid overload.

Myomectomies and resection of uterine septum were the hysteroscopic procedures with the highest complication rates, whereas polypectomy and endometrial ablation had the lowest complication rates. In 270 polypectomies – of 925 hysteroscopic surgeries – there was not a single case of fluid overload.

In another study of 13,600 hysteroscopies, the complication rate was 0.28%. The most frequent complication was uterine perforation, with a rate of 0.76%. Fluid overload occurred in 0.2%. The complication rates, according to type of surgery, were 4.48% for endometrial ablation, 0.815% of myomectomies, and 0.38% of the polypectomies.<sup>2</sup>

A North American hospital that reviewed 227 hysteroscopies found complications in surgeries for endometrial ablation, myomectomy, and lysis of intrauterine adhesions. There was not a single complication among the polypectomies.<sup>11</sup>

In 697 hysteroscopies performed at an Italian hospital, the complication rate was 13.6%, including 5% due to fluid overload. Myomectomy was the hysteroscopic surgery which had the most complications.<sup>12</sup> In 13 hospitals in Scotland which evaluated 978 women, complications were observed in 12% of cases, and there one case of death from fluid overload.<sup>13</sup>

Excess absorption of low viscosity isoelectrolytic crystalloid, may result in volume overload leading to pulmonary edema, fluid overload, hyponatremia and cerebral edema.<sup>3</sup> Treatment should be done with use of diuretics, precise monitoring of urine output, and correction of the electrolyte imbalance. To avoid this it is necessary to control and balance the amount of distention fluid used, even when it is infused at low pressure into the uterus.<sup>5</sup>

This case demonstrates a serious complication in hysteroscopy. Fluid overload is a rare event that is more common during surgeries such as myomectomy or endometrial ablation. Polypectomy is a surgery where complications rarely occur. Fluid overload is a rare event, especially in polypectomy. Still, we should be alert with any type of hysteroscopic surgery to prevent this serious complication.

**RESUMO**

Este caso tem como objetivo mostrar que devemos ficar atentos a qualquer tipo de cirurgia histeroscópica, pois todas estão sujeitas a complicações, sendo que estas podem cursar danos permanentes às pacientes e até casos de morte. O caso descrito é de uma mulher de 72 anos que foi submetida a uma histeroscopia diagnóstica por espessamento endometrial. Durante o procedimento foi observado a presença de um pólipó endometrial fúndico ocupando toda cavidade. A paciente foi então submetida à histeroscopia cirúrgica para polipectomia. Após vinte minutos do início da cirurgia, com infusão de seis litros de glicina, a paciente apresentou intoxicação hídrica e o procedimento foi suspenso. A paciente recebeu suporte hídrico e reposição hidroeletrólítica e em 48 horas recebeu alta em bom estado geral. Esse caso ilustra um relato de uma complicação da histeroscopia. As complicações da histeroscopia são raras, principalmente nas polipectomias com taxas em torno de 0,4%. Dentre as complicações podemos citar perfuração uterina, infecção, hemorragia, lesões de órgãos adjacentes, trauma cervical, embolia gasosa, intoxicação hídrica. A intoxicação hídrica geralmente decorre de cirurgias histeroscópicas maiores como miomectomias e ablação de endométrio. Na polipectomia histeroscópica é raro apresentar este tipo de complicação.

**Palavras-chaves:** Intoxicação hídrica, histeroscopia, polipectomia.

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# Laparoscopic Biliopancreatic Diversion with Gastric Preservation in a Patient with Down Syndrome

## Derivação Biliopancreática Laparoscópica com Preservação Gástrica em um Paciente com Síndrome de Down

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### ABSTRACT

Patients with Down syndrome have a higher prevalence of obesity when compared to the general population. Binge eating in superobesity is an important characteristic that makes treatment more difficult. This is a case report of a laparoscopic biliopancreatic diversion with gastric preservation undergone by a morbidly obese woman with Down Syndrome, after extensive evaluation of the patient as well as her parents' psychological profile. The technique allows better post-operative control of food ingestion, achieving effective weight loss after surgery without major complications.

**Key words:** Down Syndrome, Obesity, Laparoscopic Biliopancreatic Diversion.

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### INTRODUCTION

Down Syndrome (DS) is the most common chromosomal abnormality among live births, affecting approximately 1 in 1,000 individuals.<sup>1-4</sup> Individuals with Down Syndrome have a higher prevalence of obesity as compared with the general population (45% versus 33% for men, 56% versus 36% for women).<sup>5,6</sup> Little is known about the etiology of obesity in such cases. However, hypoactivity, reduced metabolic rates and malnutrition — all characteristics of DS patients — may have a close relationship with the etiology.<sup>7</sup> Moreover, the genetic alteration present in this syndrome may in itself lead to increased physical disability, hampering mobility, and leading to sedentarism.<sup>8,9</sup>

Biliopancreatic Diversion (BPD) with Gastric Preservation consists of complete sectioning of the proximal first third of the stomach (about 13 cm from the esophagogastric transition along the large curvature), with preservation of about 40% of the stomach's volume. The ileocecal valve is identified and marked with a suture stitch 50 cm proximal to the valve. The jejunum is sectioned, so that the remaining alimentary channel is approximately 200 cm. A

gastrojejunal anastomosis is done using a linear cutting stapler, passing the distal intestinal stump through an orifice opened in transverse mesocolon at the Treitz Angle. The rest of the stomach (60%) is excluded, but not removed as in the Scopinaro technique. The jejuno-ileal anastomosis is 50 cm from the ileocecal valve.<sup>10,11</sup>

We present the case of 28 year old patient with DS, a BMI of 57, in whom we performed this surgical intervention in order managing the morbid obesity. We believe this is the first case reported in literature of a patient with DS undergoing bariatric surgery.

### CASE REPORT

CSS, 28 years old, female, with Down Syndrome, long-standing obesity (BMI 57), who sought our service along with her parents, after being treated for morbid obesity by an endocrinologist, nutritionist and psychiatrist. She had been able to lose 28 kg, but regained the weight. She reported a history of binge eating and was being treated for Chronic Furunculosis. The patient was well oriented, as well as being assisted by her family, and expressed her



desire to undergo bariatric surgery. Pre-operative laboratory tests showed elevated transaminases and subclinical hypothyroidism. Abdominal ultrasound imaging was suggestive of hepatic steatosis; an upper digestive endoscopy was unaltered.

The patient underwent BPD with the described technique, with no complications. During the hospitalization, the patient tolerated the diet well, and produced 3 to 4 pasty stools daily, with no fever and no nausea. On the eighth post-operative day, she developed a periumbilical hematoma, seroma drainage through one of the portals, and cellulitis on the lower belly.

The mother reported that in the first two months the patient had episodes of anxiety and depression associated with partial rejection of the diet and physical activity. Four months after surgery, she had lost 29.5 kg, and still presented episodes of binge eating associated with epigastric pain. After a year and five months, with loss of 43 kg and BMI of 37, she feels happy and is active, and the family is satisfied with the outcome. On average, she has three bowel movements a day. She takes a multi-vitamin and undergoes clinical and laboratorial surveillance every three months. To date, there has been no evidence of anemia nor vitamin or protein deficiencies.

## DISCUSSION

As Down Syndrome itself can stigmatize, obesity can interfere with the ability to socialize and perform physical activities, capabilities that are very important for the physical and emotional development of these individuals.<sup>5,6</sup> Excess weight increases the risk of, hypertension, diabetes, and acute myocardial infarction leading to shorter life expectancy.<sup>4</sup> These facts indicate the need for effective treatment of

obesity and management of comorbidities to improve life expectancy.<sup>6,12,13</sup>

BPD, by combining early restriction and long lasting disabsorption, leads to an effective and well tolerated loss of excess weight.<sup>11-14</sup> Benefits of weight loss include normalization of secondary hypertension, hypercholesterolemia, and the prospect of reversing type II diabetes mellitus.<sup>13,14</sup> The use of videolaparoscopy reduces the occurrence of incisional hernias and infections, thereby reducing post operative pain and accelerating ambulation.<sup>11,15</sup> The gastric preservation possible with this technique, also described by Domene, makes the surgery completely reversible. This option is extremely important in this case, because of the patient's and her family's psychological profile there were concerns regarding the acceptance of the surgery and post-operative eating behavior. Moreover, gastric preservation can reduce morbidity by lessening surgical trauma and also reduces the possibility of duodenal stump fistulas. Retaining a gastric pouch with dimensions that allow a normal diet facilitates the post-operative psychological-psychiatric management.<sup>10</sup>

## CONCLUSION

Considering that the superobese present serious eating disorders – with up to two-thirds having significant binge eating disorders and nearly half having significant psychiatric disorders – in electing a Biliopancreatic Diversion with Gastric Preservation the option of reversing the process is maintained and a gastric volume suitable for a more disabsorptive weight loss instead of a restrictive one is preserved, allowing more flexible clinical management going forward.<sup>10</sup>

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## RESUMO

Portadores de Síndrome de Down apresentam uma maior prevalência de obesidade quando comparados com a população em geral. A compulsão alimentar na superobesidade é uma característica marcante, o que torna mais difícil o seu tratamento clínico. Relatamos um caso de derivação biliopancreática videolaparoscópica com preservação gástrica em uma mulher superobesa e com Síndrome de Down, após ampla avaliação do perfil psicológico da paciente e de seus pais. A técnica disabsortiva possibilitou um melhor controle alimentar pós-operatório, obtendo efetiva perda de peso após a cirurgia e evoluindo sem complicações maiores.

**Palavras-chave:** Síndrome de Down - Obesidade - Derivação Biliopancreática Videolaparoscópica.

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Ex: Philips SJ, Whiosnant JP. Hypertension and stroke. In: Laragh JH, Brenner BM, editors. Hypertension: pathophysiology, diagnosis and management. 2<sup>nd</sup> ed. New York; Raven Press; 1995. p.465-78.

- **Conference Paper**

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- **Dissertation**

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- **Opinion or technical articles online**

Ex: Carvalho ACP, Marchiori E. Manual de orientação para a elaboração de monografias, dissertações e teses. Avaiálbre from: URL <http://www.radiologia.ufrj.br/manual.htm> [consulted on 08/12/2002].

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**November 6 - 10, 2010**

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E-mail: seu@uroweb.org

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Malaga, Spain

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E-mail: essm@cpo-hanser.de

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E-mail: afu@colloquium.fr

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E-mail: akcetin@st-antoni-us-gronau.de

Website: www.dgru.degru.de

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