

# Evaluation of underwater endoscopic mucosal resection for colorectal polyps in an outpatient clinic in Brazil

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**ABSTRACT – Background** – Since 2012, a new technique for resection of large polyps has been described, the underwater endoscopic mucosal resection (UEMR). Some advantages that emerge from it is the needless of injection in submucosal layer and a greater chance of complete capture of the polyp. **Objective** – There are few studies of UEMR in Brazil. The aim of this study is to evaluate the safety and efficacy of this technique in one Brazilian center. **Methods** – This case series was conducted from February to December of 2020. Colorectal polyps greater than 9 mm without features of deep submucosal invasion were resected using UEMR. **Results** – Twenty-four large polyps were resected with the UEMR approach from 24 patients. The mean size of the polyps was 19 mm, ranging from 12 to 35 mm. All lesions were successful resected and 66% (16/24) were resected en bloc. In histologic analyses, most of them were adenomas (70.8%) and only one had deep submucosal invasion. There were no cases of acute complications, such perforation or acute bleeding. **Conclusion** – The UEMR is a safe and feasible procedure. With the emerging data on the procedure, it seems to be a wonderful tool in preventing colorectal cancer and its applicability and scope should be encourage to surpass reference centers.

**Keywords** – Underwater endoscopic mucosal resection; colorectal polyps; conventional endoscopic mucosal resection.

## INTRODUCTION

The use of colonoscopy for screening patients for colorectal cancer (CRC) and polyps removal is associated with reduction in CRC mortality<sup>(1)</sup>. Among patients undergoing a screening colonoscopy in the United States, 4–11% will be found a large colorectal polyp<sup>(2)</sup>. In the past, they used to be usually treated with surgery. However, with the development of advanced endoscopic treatments, there has been a shift in the best practice towards colonoscopy<sup>(3)</sup>. This is due to the endoscopic modality is safer than surgery<sup>(4-6)</sup> as well as more cost effective<sup>(7)</sup>.

The conventional endoscopic mucosal resection (CEMR) is the standard for treating sessile polyps with more than 9 mm of diameter<sup>(3)</sup>. Despite this technique is appropriated for most polyps, the submucosal injection may make snare capture more difficult<sup>(8)</sup>. Since 2012, a new technique for resection of large polyps has been described, the underwater endoscopic mucosal resection (UEMR)<sup>(9)</sup>. In this approach, there is no need for submucosal injection and the separation of the layers is given by the allocation of water in the lumen. The studies reporting this technique are promising<sup>(10-13)</sup>.

Despite the current available data, there are few studies of UEMR in Brazil<sup>(8,14)</sup> and those are related to reference centers. This study aimed to evaluate the safety and efficacy of UEMR in sessile lesions in our center.

## METHODS

From January 2020 to December 2020, outpatients referred to our service who underwent UEMR for sessile polyps >9 mm were included. Twenty-four UEMR were performed in 24 different patients. Inclusion criteria were: patients who were performed UEMR by any of the eight endoscopists; a diagnostic of a non-pedicated polyp; size >9 mm; no findings of invasive disease (indurations, previous description of non-lifting sign, ulceration, evaluation by pit patterns without features of submucosal invasion).

All the procedures were performed on an outpatient basis and with anesthesiology assistance. The colonoscope used was a high definition equipment (EPK-1000 High-Resolution – Pentax Lifecare, Tokyo, Japan). Before the exchange of air to water, it was administrated intravenous hyoscine. There was no cap allocation on the scope.

After the diagnosis of the lesion, a chromoscopy was performed by solution of indigo carmine 1%. Then, air was evacuated and distilled water was infused. In half of the cases, diathermic demarcation was performed with the snare prior to resection (FIGURE 1). The resection was conducted by catching the lesion with snares and a pre-set electrosurgical unit (WEM SS-200E – Medtronic, Dublin, Ireland) was configured in the Blend-1 and Ecut functions (FIGURE 2). If there were any remnant lesions, it could be retrieved with snare or biopsy forceps.

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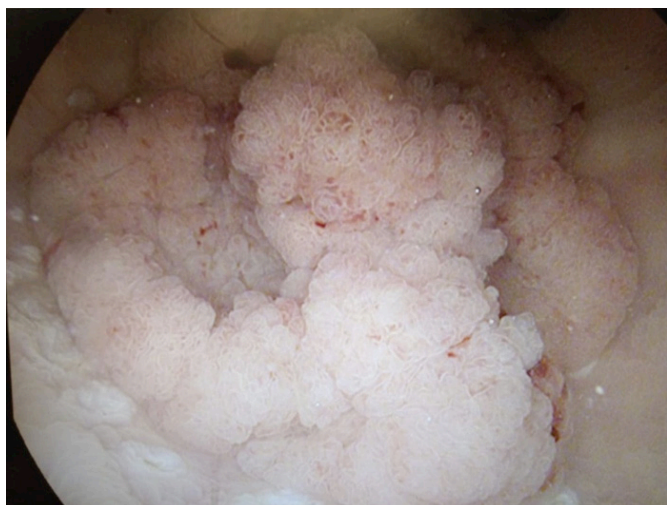


FIGURE 1. Lesion found in the rectum after marked with snare tip and the air exchanged for water.



FIGURE 2. The same lesion of the rectum after complete resection.

It was used two types of snares: 13 mm Captivor II (Boston Scientific, Marlborough, USA) or 27 mm Captiflex (Boston Scientific, Marlborough, USA). The choice of the snare was made according the endoscopist preference. If the endoscopist finds necessary, prophylactic clips (resolution – Boston Scientific, Marlborough, USA) were placed in the bed of resection.

The study was approved by the Ethical Committee board of the Hospital.

## RESULTS

The majority of patients were men (54%) with a median age of 65.3 years. 3 (12.5%) were found in the cecum; 9 (37.5%) in the ascending colon; 1 (4.5%) in the transverse; 1 (4.5%) in the descendent; 7 (29.2%) in the sigmoid colon; and 3 (12.5%) in the rectum. The mean size of the polyps was 19 mm, ranging from 12 to 35 mm. The main characteristics are demonstrated in TABLE 1.

TABLE 1. Main characteristics.

Main characteristics	Total number of lesions (%)
Male	13 (54)
Female	11 (46)
Age (years)	
Median	65.2
Lesion size (millimeter)	
Median (range)	19 (12-35)
Lesion localization, n (%)	
Cecum	3 (12.5)
Ascending	9 (37.5)
Transverse	1 (4.2)
Descending	1 (4.2)
Sigmoid	7 (29.2)
Rectum	3 (12.5)
Histology, n (%)	
Tubular adenoma	8 (33.3)
Tubulovillous adenoma	8 (33.3)
Hyperplastic	4 (16.6)
Serrated adenoma	2 (8.4)
Villous adenoma	1 (4.2)
Adenocarcinoma	1 (4.2)

It was able to perform all the 24 (100%) resections that were attempted with the UEMR technique. Regarding the size of the polyps, it was found 10/24 (41.7%) between 10–15 mm; 8/24 (33.3%) between 16–20 mm; 2/24 (8.3%) between 21–30 mm; and 4/24 (16.7%) bigger than 30 mm. In 5 (33.3%) polyps, prophylactic clips were placed, four of them in the cecum and one in the ascending colon.

The en bloc resection was achieved in 16/24 (66.7%) polyps; piecemeal resection in 8/24 (33.3%). None of the cases presented acute complications of bleeding or perforation, as shown in TABLE 2.

TABLE 2. Procedures and characteristics.

Procedures and characteristics	n (%)
Resection	
Complete	24 (100)
Incomplete	0 (0)
Type of resection, n (%)	
En bloc	16 (66.7)
Piecemeal	8 (33.3)
Complications	
Bleeding	0 (0)
Perforation	0 (0)

Regarding the histologic findings, 17 (70.8%) were adenomas, 4 (16.6%) hyperplastic, 2 (8.3%) serrated adenomas lesion and 1 (4.1%) adenocarcinoma with more than 1000  $\mu$ m invasion of the submucosa layer. It was not possible to evaluate the depth of lesions in 20/24 (83.3%) lesions. In 3 (12.5%) polyps, the margins were free of lesions and in 1 (4.1%) there was invasive adenocarcinoma.

## DISCUSSION

In this study, it has been able to show the safety and an adequate en bloc rate using UEMR.

The use of the injection of a solution on the submucosal layer and the posterior CEMR is well known as a great therapeutic option for the treatment of large colorectal polyps<sup>(3)</sup>. However, the use of CEMR, despite it provides a possible “safety cushion”, decreasing the risk of iatrogenic perforation and/or thermal injury, it may not allow the snare to capture the lesion in its fullness<sup>(15)</sup>. Besides, there is a concern regarding the risk of needle tracking neoplastic cells into deeper wall layers<sup>(16)</sup>.

Binmoeller et al.<sup>(9)</sup> showed the separation of the mucosa and submucosa layers by endoscopic ultrasound when the organ was exposed to immersion in water, avoiding the injection in the submucosal.

Another possible vantage of the use of the water in treating large polyps is the better evaluation of the borders. As previously reported<sup>(17)</sup>, water immersion can enhance the sensitivity of endoscopy and allows a more careful evaluation of a post-resection adenoma-free margins. Furthermore, water immersion tends to reduce the size of the lesion, allowing a greater chance of complete capture of the polyp with the snare<sup>(18)</sup>.

After the first reports in 2012<sup>(9)</sup>, several trials were performed in order to demonstrated the safety and efficacy of UEMR. A recent meta-analyses<sup>(11)</sup> more than 500 lesions evidenced more than 96% of complete resection rate, with an en bloc rate of 57% and a low recurrence rate (8.8%). Moreover, the rate of bleeding was low (less than 3% of cases) and no cases of perforation. Another meta-analyses showed a higher rate of en bloc resection in the UEMR arm especially in polyps  $\geq 20$  mm and with reduction in the rate of recurrence, without difference in the complications<sup>(19)</sup>.

In Brazil, there are few reports of UEMR. In the larger study<sup>(8)</sup>,

65 lesions were evaluated. The success rate was 98.5% and the en bloc resection was 61.5%. The other two studies published in Brazil, to our knowledge, had only four<sup>(20)</sup> and 14 lesions<sup>(14)</sup>.

The present study has very similar rates from the previous studies. It was able to show a 100% of complete resection with an en bloc resection of 66% of cases. In the histopathological analyses, only one case was found to have deep invasion.

Some limitations have to be noted. First, this is a transversal study of only one center. Second, the follow up of the included patients after their index colonoscopy was not possible in order to evaluate recurrence or late complications, due to the retrospective character of the study. Third, the histology was compromised in many cases, not allowing a full description of the resected lesions.

Although the data shows a trend on the use of endoscopic procedures, surgery for non-malignant colorectal polyps has increased in the past years. A possible explanation would be that inappropriate referrals and “failed” attempts of endoscopic resection<sup>(21)</sup>, which may form scars that makes the procedure more difficult or sometimes impossible.

In conclusion, the UEMR is a safe and feasible procedure. With the emerging data on the procedure, it seems to be a wonderful tool in preventing colorectal cancer and its applicability and scope should be encourage to surpass reference centers.

## Authors' contribution

Data collection: Schacher FC, Braga QM, Severo HR, Barlem GG, John JA, Sander GB. Survey execution: Braga QM, Severo HR. Writing of text: Schacher FC, Braga QM. Statistical analyses: Braga QM, Sander GB. Writing-review and editing: Severo HR, Barlem GG, John JA, Sander GB. Project administration: Schacher FC, Barlem GG, John JA, Sander GB. Supervision: Schacher FC, John JA.

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Schacher FC, Braga QM, Severo HR, Barlem GG, John JA, Sander GB. Avaliação de ressecção de mucosa endoscópica sob imersão d'água de pólipos colorretais em um centro ambulatorial no Brasil. *Arq Gastroenterol.* 2021;58(3):390-3.

**RESUMO – Contexto** – Desde 2012, uma nova técnica para ressecção de pólipos grandes tem sido descrita, a ressecção da mucosa endoscópica sob imersão d'água (REMS). Algumas vantagens que surgem desta técnica são evitar a injeção na camada submucosa e a maior chance de captura completa do pólipo. **Objetivo** – Há poucos estudos com REMS no Brasil. Nosso objetivo é avaliar a segurança e a eficácia da técnica em um centro brasileiro. **Métodos** – Esta série de casos foi conduzida de fevereiro a dezembro de 2020. Pólipos colorretais maiores que 9 mm sem sinais endoscópicos de invasão de submucosa foram ressecados utilizando RMES. **Resultados** – Vinte e quatro pólipos foram ressecados com RMES em 24 pacientes diferentes. O tamanho médio dos pólipos era de 19 mm, variando de 12 a 35 mm. Todas as lesões foram ressecadas e 66% (16/24) foram ressecadas em monobloco. Na análise histológica, a maioria era adenoma (70.8%) e apenas uma havia invasão profunda da submucosa. **Conclusão** – O uso de REMS é um procedimento seguro e factível. Com o aumento de dados relativos ao procedimento, esta parece ser uma excelente ferramenta na prevenção do câncer colorretal e sua aplicabilidade deve ser encorajada para fora dos centros de referência.

**Palavras-chave** – Ressecção da mucosa endoscópica sob imersão d'água; pólipos colorretais; ressecção endoscópica de mucosa convencional.

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