

## Argon plasma coagulation in the treatment of post-radiotherapy rectal bleeding

### *Argon plasma coagulation nel trattamento della proctite emorragica causata dalla radioterapia*

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#### Summary

**Introduction:** Chronic radiation proctitis is often associated to radiotherapy for treatment of pelvic cancer. The most common side effect of this pathological condition is rectal bleeding but despite the great number of clinical approaches and techniques that have been employed no consensus for the management of it is available. Although prospective randomized trials about hemorrhagic radiation proctitis are still lacking, endoscopic approach delivering an Argon Plasma Coagulation (APC) seems to be a successful and available option. **Patients and Methods:** Sixteen patients suffering from post-radiotherapy rectal bleeding were followed. In the nine cases presenting a rectum ulcerative colitis (RUC) like endoscopic picture a 5-ASA therapeutic approach was chosen initially, followed by an

#### Riassunto

**Introduzione:** La proctite cronica è spesso associata a terapia radiante per il trattamento dei tumori della zona pelvica. La complicanza più comune della proctite è il sanguinamento rettale ma, nonostante le numerose tecniche utilizzate nel trattamento di tale patologia, nessuna di esse viene universalmente ritenuta la migliore. Sebbene non esistano ancora trials randomizzati sulla proctite associata a radioterapia, l'Argon Plasma Coagulation (APC) per via endoscopica sembra un'alternativa di facile realizzazione e successo. **Pazienti e Metodi:** Dei sedici pazienti affetti da sanguinamento rettale conseguente a radioterapia oggetto dello studio, nove manifestavano un quadro endoscopico caratteristico della rettocolite ulcerosa (RCU), sette presentavano un quadro clinico più lieve con sole aree di telangectasia. I

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**APC treatment of areas of telangectasias.** The other cases, presenting only areas of telangectasias, were treated only with APC. *Results:* 5-ASA therapy led to an improvement of inflammation state related to RUC but recurrence of rectal bleeding caused by telangectasias was observed. In these cases an additional APC treatment gave a total remission of the problem. Also in the other cases, presenting only areas of telangectasias, a remission of rectal bleeding was achieved through APC application. *Conclusions:* In the cases of radiation proctitis characterized by a severe compromission of rectal mucosa integrity an anti-inflammatory pharmacological therapy is necessary but not sufficient to abrogate rectal bleeding which is often caused by the presence of areas of telangectasias. In these cases a remission of the problem could be achieved through a combination of anti-inflammatory therapy (5-ASA) and APC. *Eur. J. Oncol.*, 17 (1), 37-41, 2012

**Key words:** Argon Plasma Coagulation, hemorrhagic radiation proctitis, anti-inflammatory therapy in ulcerative colitis

## Introduction

The treatment of pelvic malignancies, including prostate cancer and cancer of cervix and uterus, is based on ionizing radiations which cause submucosal tissue injury to the rectal wall leading to chronic radiation proctitis (Fig. 1). Its development depends on the modalities of radiotherapy administration as well as other factors including previous proctocolitis, history of smoking, diabetes mellitus. There is no agreement about the exact pathophysiology of radiation proctitis but the currently accepted hypothesis proposes a combination of radiation-induced ischemia and fibrosis (1).

Rectal bleeding is the main sign of radiation proctitis and it is generally moderate but it may also be severe causing hemodynamic disturbances which need specific therapeutic management (blood transfusion). Other side effects such as diarrhea, inconti-

nence, pain, tenesmus, rectovaginal fistula, may also occur compromising the quality of life.

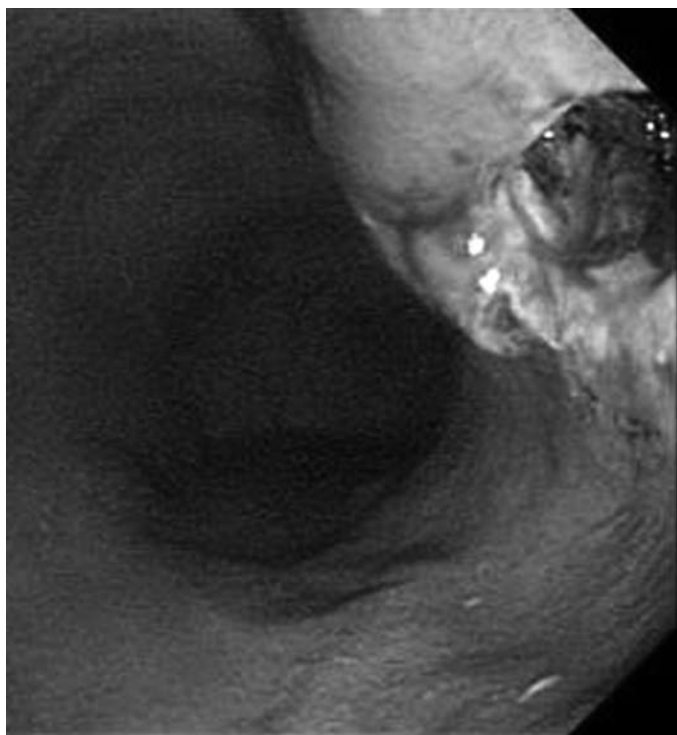
pazienti del primo gruppo sono stati trattati inizialmente con 5-ASA e successivamente sottoposti ad APC nel tentativo di eliminare le aree di telangectasia. I pazienti del secondo gruppo sono stati sottoposti solamente ad APC. *Risultati:* Il trattamento con 5-ASA ha determinato un miglioramento dello stato infiammatorio correlato alla RCU ma la scomparsa del sanguinamento rettale si è osservato solo in seguito ad APC. Questa è risultata risolutiva anche nei pazienti che mostravano solamente aree di telangectasia. *Conclusioni:* Nei casi di proctite post-radioterapia associati ad una severa compromissione dell'integrità della mucosa rettale una terapia farmacologica antinfiammatoria è necessaria ma non sufficiente ad eliminare il sanguinamento rettale causato dalla presenza di aree di telangectasia. In questi casi la completa remissione della patologia può essere ottenuta aggiungendo alla terapia antinfiammatoria il trattamento con APC. *Eur. J. Oncol.*, 17 (1), 37-41, 2012

**Parole chiave:** Argon Plasma Coagulation, proctite emorragica dopo radioterapia, terapia antinfiammatoria nella retto colite ulcerosa

nence, pain, tenesmus, rectovaginal fistula, may also occur compromising the quality of life.

The endoscopic aspect of radiation proctitis is characterized by the presence of more or less dense telangiectasia dispersed locally or in a diffuse manner over the rectal mucosa which bleeds easily, particularly at introduction of the endoscope. The lesion begins at the dentate line and it may localize to one part of the rectum or may extend to the sigmoid. Interestingly it has been proposed that this chronic microvasculature injury could be partially determined by an alteration of the thrombomodulin expression in endothelial cells which is a consequence of radiotherapy (2).

A large number of treatment has been proposed for hemorrhagic radiation proctitis. Pharmacological agents used for this purpose (oral, topic or mixed) are often unsatisfactory, with partial recovery and short term relapses. Several case series have proved



**Fig. 1.** Ulceration of anterior rectal wall following radiotherapy

disappointing results with topical or oral sulfasalazine, 5-aminosalicylic acid (5-ASA) and corticosteroids (3-5).

A certain degree of efficacy has been reported with topical formaldehyde and topical or oral sucral-fate (6-8).

Development of new endoscopic procedures has led to a higher rate of therapeutic success and longer period of symptomatic control. The goal of endoscopic therapy is to ablate the angioectasia with a resultant improvement in the severity and frequency of rectal bleeding. Both laser and mono or bipolar electrocoagulation have been considered to be the most effective methods of treatment for these patients. However both techniques are associated with potential morbidity derived from the difficulty of assessing the depth of the thermal effect on the rectal wall.

APC is a relatively new method of non-contact electrocoagulation well suited for hemostasis of large bleeding areas. In this paper we describe our experience in the treatment of patients suffering from radiation-induced proctitis with both pharmacological therapy (5-ASA) and APC.

## Patients and Methods

From January 2005 to March 2008 we followed, at the service of our Endoscopy Unit within the Department of Oncology, sixteen patients, eleven males and five females aged between 41 and 78 years (range 62.3) who suffer from post-radiotherapy rectal bleeding. Eleven out of the sixteen patients suffer from prostate cancer, three from endometrial cancer and two from cervical cancer.

All patients underwent total colonoscopy to exclude other causes of bleeding. The equipment used were standard colonoscopes: Olympus CF 100 videoendoscope, connected to Olympus CV 100 videoprocessor, an APC equipment with APC probe with external diameter of 2 mm and internal diameter of 1.5 mm, argon delivery unit (ERBE Argon Plasma Coagulator ICC 200, ERBE Electromedizin, Tubingen, Germany). The argon gas flow was set between 1.5 and 2 l/min at 40-60 W power.

Five patients had been treated at other divisions and eleven were at the first observation. Nine out of other eleven patients showed a RUC-like endoscopic picture with intensely hyperemic mucosa, rough, crumbly bleeding involving the entire wall and not extending more than 25-30 cm from the anal. In the remaining two cases there was a similar picture to that found in the other, but more nuanced, and presence of numerous telangiectasias in areas free from erosion was observed.

The first nine cases were treated with 5-ASA, in the other two cases APC therapy was started immediately. The nine patients initially treated with 5-ASA were examined after two weeks. The RCU-like picture disappeared but we observed areas of telangiectasia which were treated with APC.

In the five cases showing recurrent episodes and which involve other treatments at other centers, we found endoscopically areas of telangiectasia which were treated with APC.

## Results

All patients underwent a careful follow-up every three months. Patients who began treatment with 5-ASA had a rapid remission of symptoms and improvement in the inflammation state. Some of

these, however, during the follow-up showed a new bleeding associated to telangiectasias (Fig. 2) without mucosal inflammation. In these cases APC was the therapeutic approach (Fig. 3).

Rapid disappearance of rectal bleeding was achieved in patients who underwent APC therapy since the first session of treatment. The endoscopic coagulation performed every 6-12 months was able to easily treat other telangiectasias eventually arisen.

All patients showed no symptoms and negative endoscopic picture during a two years follow-up and six months after the last control.

## Discussion

APC shows many advantages (9). The unit is compact, mobile and easy to maintain, it is simple to perform and easily learnt. The non-contact nature of application allows large areas to be treated rapidly, in contrast to contact thermal techniques such as heater probe or multipolar diathermy. The technique creates less smoke than laser therapy, allowing better views and shorter treatment time. The favourable features of APC are related to its predictable depth of

tissue destruction and preferential arcing to areas of non desiccated tissue when it is utilized in a non-contact fashion (10).

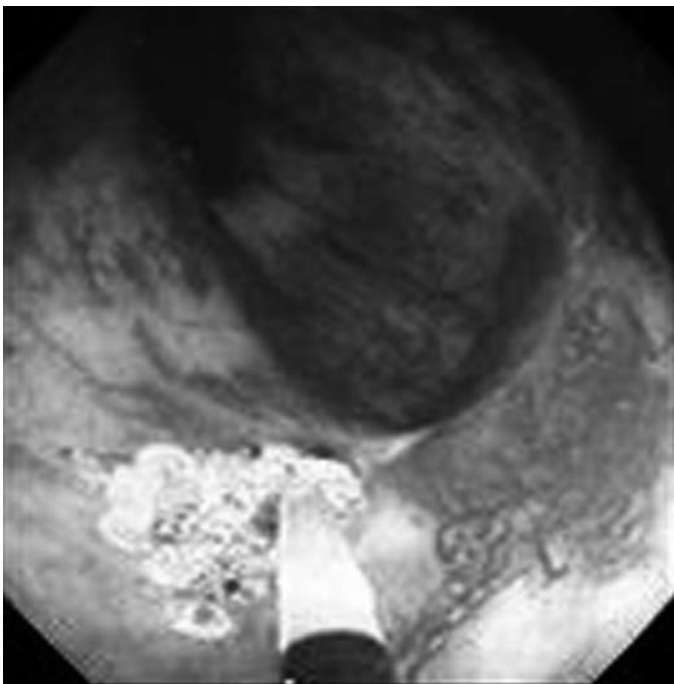
APC has been used in gastrointestinal endoscopy since 1994 (11). Three years later were reported preliminary results about APC treatment of radiation-induced proctitis (12).

From this preliminary experience the efficacy and safety of APC have been suggested in several case series (13-17).

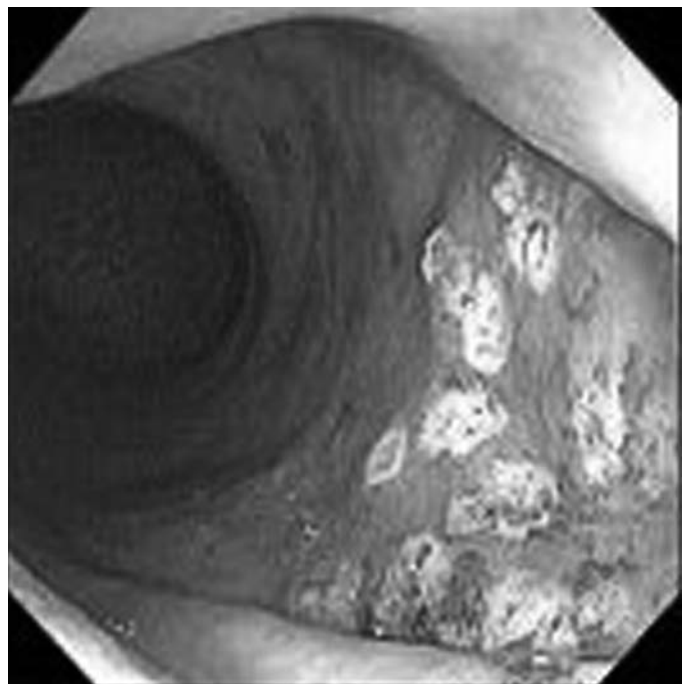
The results in this study provide further data about the efficacy, safety and well-tolerance of APC in chronic rectal bleeding related to radiation proctopathy; another interesting approach, reported in literature, consists of bipolar coagulation (18).

No complications were encountered in this series. All the patients were without disease after two years of follow-up.

In the patients with an endoscopic presentation like-RUC the initial use of oral 5-ASA obtained a rapid remission of the clinical manifestation and the endoscopic aspect. The subsequent use of APC over rectal telangiectasia led to a complete and persistent clinical remission.



**Fig. 2.** Post-radiotherapy proctitis. Rectal bleeding was treated with APC. During the procedure the probe is not in close contact with the mucosa allowing the argon gas to perform its cauterizing effect when burned



**Fig. 3.** Post-radiotherapy proctitis with rectal bleeding. Cauterization of bleeding lesions was achieved through APC treatment

## Conclusions

The authors believe that the post-radiotherapy rectal bleeding is caused initially by inflammation but, in the later steps, the formation of areas of telangiectasia reminiscent of angiodysplasia of the colon plays a crucial rôle; therefore elimination of areas of telangiectasia, using APC therapy, seems to be successful and free of complications in the treatment and prevention of recurrent episodes of rectal bleeding.

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