Treatment of radiation proctitis by coagulation: long term results

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SUMMARY

Aim — To assess long term results of coagulation (APC) treatment in hemorrhagic radiation proctitis.

Methods — Thirty patients treated with APC in 2 departments were enrolled. In 16 patients, APC was the first treatment used. A clinical scale (Chutkan) was used to assess bleeding before and after treatment. An endoscopic score (Chutkan) was used to assess results on mucosa appearance.

Results — The mean course number was 2.3 (extremes 1-5). Bleeding score decreased from 2.67 to 0.77 (P < 0.001). The success rate was 26/30 patients (87%) in an intention-to-treat analysis with 2 failures (6%), 1 patient lost for follow up and 1 patient not referred after one session. Improvement in endoscopic appearance was observed in the 13 endoscopically controlled patients with a decrease of the endoscopic score from 1.61 to 0.3 (P < 0.002). The overall morbidity was 47% with 3 severe complications (10%): 1 severe bleeding, 1 extensive necrosis of lower part of the rectum and 1 perforation. We also noticed 3 microrecties and 2 symptomless rectal stenosis. With regard to tolerance, we observed post treatment pain in 6 patients (20%), easily released by usual antalgics. Complications and side effects occurred, in all patients but one, when power shot was > 45 W. Mean follow up was 20 months (3 to 35 months). Hematochezia recurred in 4 patients, but were easily treated with 1 APC course.

Conclusion — APC is an effective treatment of hemorrhagic radiation proctitis, with a success rate of 87%. Endoscopic improvement is usual. It seems to be possible to limit the risk of complications by using low power setting.

RÉSUMÉ

Résultats à long terme du traitement des rectites radiques hémorragiques par la coagulation au plasma d’argon

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Objectif — Évaluer les résultats à long terme du traitement par coagulation au plasma d’argon (CPA) des rectites radiques hémorragiques.

Méthodes — Trente malades traités par CPA et suivis plus de deux mois, ont été inclus ; chez 16, la CPA était réalisée en première intention. L’évaluation a été faite sur des critères cliniques (score de Chutkan) et endoscopiques.

Résultats — Le nombre moyen de séances était 2,3 (extrêmes 1-5). Le score de saignement a diminué de 2,67 à 0,77 (P < 0,001). Le taux de succès était de 26/30 cas (87 %) en intention de traiter avec 2 échecs (6 %), 1 perdu de vue et 1 malade non réadressé après une séance unique. L’amélioration endoscopique a été notée chez les 13 malades contrôlés, le score d’atteinte endoscopique passant de 1,61 à 0,3 après un suivi moyen de 4,5 mois (1-20) (P < 0,002). La morbidité était de 47 %. Les complications majeures (10 %) étaient une hémorragie par chute d’escarre, une nécrose extensive peu symptomatique du bas rectum et une perforation. Nous avons observé une microrectie chez 3 malades et 1 sténose rectale peu serrée asymptomatique chez 2 autres. Des douleurs post-procédure aisément soulagées par des antalgiques ont été notées chez 6 malades (20 %). Les complications et les effets secondaires sont survenus, dans tous les cas sauf un, chez des malades pour lesquels la puissance de tir utilisée était > 45 W. Le suivi clinique moyen était de 20 mois (3-35 mois). Les rectorragies ont récidivé chez 4 malades, mais ont été traitées efficacement par une séance unique de CPA.

Conclusion — La CPA est un traitement efficace de la rectite radique hémorragique, avec un taux d’amélioration clinique de 87 %. L’amélioration endoscopique est la règle. Ces bons résultats persistent à distance du traitement initial. Les complications pourraient être limitées par l’utilisation d’une faible puissance de tir.
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. Ulceration may be extensive and stricture formation may occur or more rarely fistulization has also been observed. The lesions are usually localized to one part of the rectum and may extend to the sigmoid [1, 4].

Argon plasma coagulation (APC), one of many treatments proposed for this very invalidating condition, is achieved by monopolar electrocoagulation using a high-frequency current delivered by a tungsten electrode. The neutral electrode is applied to the skin. Between the tungsten electrode and the lesion, the electrical current flows through where electrons circulate freely in a mass of argon atoms [5]. The purpose of this study was to report results obtained in two departments using APC for the treatment of hemorrhagic radiation proctitis (HRP).

Patients and methods

Patients

From April 1, 1996 to September 1, 2000, 33 patients were treated with APC: 17 in the Trocadéro Medical-Surgical Center in Paris and 16 in the Mulhouse Hospital Center in Mulhouse France. Thirty of these patients followed up for at least two months were included in this study.

The study group included 23 men and 7 women, mean age 70.7 years (range: 58-85). These patients had been given radiotherapy for cancer of the prostate (n = 23), uterine adenocarcinoma (n = 4), cervical cancer (n = 1), squamous-cell cancer of the anus (n = 1) and uterine sarcoma (n = 1). Signs of proctitis appeared at a mean of 2 years and 2 months (range: 2 months-8 years) after radiotherapy. Prior treatment had been unsuccessful in 14 patients: 10 were given rectal steroids (and 3 after rectal 5 ASA), rectal 5 ASA (4 patients, followed by rectal steroids for 3), topical formalin (1 patient), or Yag laser (2 patients). APC was given as first intention treatment in 16 patients.

Total colonoscopy was performed before treatment or shortly after starting treatment in all patients in order to rule out any other cause of the bleeding.

Clinical and endoscopic criteria were used to assess disease severity. The clinical criteria were described by Chutkan et al [6]: no bleeding (grade 0), a little blood on toilet paper or the surface of the stools (grade 1), blood in the toilet during defecation (grade 2), major bleeding with clots (grade 3), bleeding requiring transfusion (grade 4).

As a validated endoscopic scoring system is not available for hemorrhagic radiation proctitis, we used the following endoscopic criteria: normal aspect or presence of few telangiectasia (grade 0), fragile mucosal bleeding at introduction of the endoscope (grade 1), spontaneous local bleeding of the mucosa (grade 2), diffuse hemorrhagic mucosa (grade 3).

The mean clinical score was 2.67: grade 4 (5 patients), grade 3 (10 patients) grade 2 (15 patients). The mean endoscopic score was 1.61: grade 3 (5 patients) grade 2 (8 patients), grade 1 (17 patients). The five Chutkan grade 4 patients had anemia and required transfusion. Four of these 5 patients needed only one transfusion performed shortly before the first APC session. One patient had required regular transfusions for 11 months before starting APC.

Methods

The APC session began with a polyethylene glycol preparation when colonoscopy was performed at the same time or by two Normacol enemas 2 hours before the examination if the exploration was limited to the rectosigmoid.

ABBREVIATIONS:

- APC : argon plasma coagulation
- HRP : hemorrhagic radiation proctitis

The following equipment was employed: Olympus (PCF 130 L, CF 130 L, GIF Q 140) and Fuji (C 200WMZ) video endoscopes and an APC 300 coagulator coupled with an Erbotom ICC 200 generator (Erbe Elektromedizin, Tuebingen, Germany) operating at the following settings: power 30W to 80W (mean 42), gas flow 0.8 – 2 L/min (mean 1.5 L/min). Depending on the endoscopic aspect, shots were delivered in spots (scattered telangiectasia) or scanned over the surface (diffuse bleeding or clusters of telangiectasia). Generally only relatively limited areas of the mucosal surface were scanned, the entire circumference was scanned only in exceptional situations. Endoscopy was performed by three senior operators who had at least 10 years experience with digestive endoscopy and had performed Laser treatment as a routine practice for several years. The three operators treated 16, 11 and 3 patients, respectively.

APC sessions were pursued until all the telangiectasia had been eliminated or bleeding had ceased. In general, a second endoscopy was scheduled one month later with and APC session if rectal bleeding persisted. Repeated sessions were performed at one-month intervals.

The patients were followed clinically and endoscopically but certain patients without symptoms did not have a follow-up endoscopy after the last APC session.

Long-term data were collected by mail and for certain patients by telephone interview with the primary care physician (general practitioner, gastroenterologist, oncology-radiotherapy specialist). At least one physician was contacted for each patient. A questionnaire was also sent to the patients to ascertain the clinical data concerning the criteria described above and to collect the patient’s assessment of rectal symptoms. Information collected included intensity of pain, presence of incontinence, frequency of stools and any other treatment given after APC.

Statistical analysis

Paired scores (bleeding score and endoscopic aspect before and after APC) were compared with the Student’s t test for bleeding and Wilcoxon’s rank test for the endoscopic aspect.

Results

The 30 patients underwent 69 APC sessions (mean 2.3, range: 1-5).

Clinical data

One patient was not referred again after a first APC session. One other patient was lost to follow-up. Bleeding decreased significantly in the other patients: mean clinical score fell from 2.67 to 0.77 after APC (P < 0.001) (figure 1). There were two failures (6%). On an intention-to-treat basis, the rate of success was 87% (26/30 patients). Improvement was observed in 4 of the 5 patients who required transfusion before APC with interruption of the transfusions after the first session.

Endoscopy findings

Only 13 patients had a second endoscopy. Symptom improvement was considered sufficient in the other patients. The endoscopy score fell from 1.61 to 0.3 (P < 0.002) in the 13 patients who underwent a second endoscopy (figure 2). An example of endoscopic improvement is presented in figures 3 and 4.

Complications

Three patients developed serious complications: one had extensive necrosis of the lower part of the rectum with secondary stricture, another developed a perforation, and a third required
transfusion due to massive bleeding after desquamation of scar tissue. The necrosis occurred in a patient who had had a large radiotherapy dose: 60 Gy in 1970 followed by external radiation and curietherapy. Endoscopic sclerosis was sufficient to stop the case of massive bleeding.

At second endoscopy (13 patients), a stiff small-volume rectum with extensive microrectitis was observed in 3 patients who had been treated for proctitis involving the entire rectal ampulla. Localized stricture limited to a few centimeters of the lower rectum was seen in 2 asymptomatic patients who were given no further treatment.

Six patients (20%) experienced pain that was well relieved by second or third level antalgesics. Generally pain lasted a few days, but one patient required antalgesics for two weeks and another still complained of minor pain 4 months after APC. Complications and adverse effects as well as power of the ACP shots are given in table I. All serious complications occurred after delivery of of > 45W. The only post-procedure pain occurred after one 35W APC. Overall morbidity was 47%.

Follow-up

Follow-up data was collected with questionnaires or telephone interview with the patient or primary care physician for 28 of the 30 patients (93%). Overall, follow-up data were available for 29 (97%) of patients. Endoscopy follow-up lasted 1 to 20 months (mean 4.5); clinical follow-up 3 to 35 months (mean 20).

Recurrent rectal bleeding was observed within 6 months of initially successful APC in 4 patients. A further APC session was effective in all 4.

Discussion

A large number of treatments have been proposed for hemorrhagic radiation proctitis (HRP). Certain treatments, namely rectal steroids or salicylate, are widely used despite the lack of valid evidence of efficacy [4]. A certain degree of efficacy has been demonstrated for topical formalin [7-12], Yag laser [13-17], bipolar electrocoagulation [18,19], rectal sucralfate [20, 21], and hyperbaric oxygen therapy [22, 23]. Compared with topical formalin, APC allows treatment of areas in the sigmoid or lower rectum which are difficult to access with a topical application. In addition, although the early results with formalin were encouraging, a recent publication reported a high rate of adverse effects (68%) and failure (32%) [12]. Like other endoscopic treatments (Laser and Bicap), APC can reach zones difficult to access with an axial method and enables access using a retrovision treatment approach [24, 25]. Furthermore with APC, the depth of the coagulation can be limited and large zones can be treated by scanning. Rectal sucralfate has a long latency period: 4 weeks to obtain 77% efficacy and 16 weeks to obtain 92% efficacy [21], these rates being comparable with endoscopic treatment. Daily rectal administration is also a drawback compared with endoscopic treatments which can be completed with a small number of sessions [22, 23]. Apart from often superior efficacy, the main advantages of APC in comparison with other available treatments are thus the ability to treat lesions difficult to access with other methods, controlled depth of coagulation, and rapid action [24, 25].

The first data on the use of APC in HRP were presented in 1997 in an abstract [6] reporting results in 12 patients. We reported our early experience with 20 patients in another abstract in 1998 [26]. Since that time, and including the present report, there have been 8 series of patients treated with APC reported in original articles or abstracts [27-33]. The results are summarized in table II. While our results are similar to other reports in the literature, it must be noted that it is rather difficult to assess therapeutic efficacy in HPR. Indeed, most patients who achieve symptom improvement still experience rare episodes of minimal rectal bleeding, reporting traces of blood on toilet paper at least once a week. Using a strict application of the Chutkan classification, these are grade 1 symptoms, but since most patients in this situation consider themselves to be asymptomatic, the clinical assessment is generally grade 0. A recent French publication reported an 83% success rate [29]. In that series of 12 patients, the duration of follow-up was not indicated and the frequency of recurrence was not given. In our series, recurrent

![Fig. 1](image1.png)  
Fig. 1 – Course of clinical symptoms according to Chutkan scale.

![Fig. 2](image2.png)  
Fig. 2 – Evolution of endoscopic appearance according to the endoscopic scale.
HRP was observed in 4/29 patients after a mean clinical follow-up of 20 months. Another more recent French series published in abstract form reported 90% success in 20 patients treated with APC after a mean follow-up of 19 months (range 1-42) [33].

Shot power appears to be an important element determining the benefit-risk ratio. Early in our experience, and due to the absence of data available at that time, power was set arbitrarily, the principal objective being to obtain an electrical arc without coming in contact with the fragile and readily hemorrhagic mucosa. This led to the use of high power which was then reduced with the observation of the first complications [26]. Gas flow rate was initially an intuitive decision depending on the zone to be treated: low rates were used for lesions situated close to the probe or directly in front of it; higher rates were used for more distant or lateral lesions. Our experience suggests that a higher rate of gas flow facilitates arc formation but this is our observations at a clinical level. At the present time, it appears advisable to set the power at 45W. While the power may be increased to facilitate firing, it would be preferable to stay below 50W in light of the severe complications observed above this limit. Firing appears to be too difficult below 40W. A flow rate of 0.8 to 1.2 L/min is generally sufficient to obtain a good electrical arc. A higher rate insufflates too much gas and is poorly tolerated.

In conclusion, our results in a large number of patients confirm the efficacy of APC for the treatment of HRP and demonstrates that successful treatment persists for up to 45 months. APC is easy to use and should be proposed as the first intention treatment. We draw attention to the risk of complications which can probably be avoided by choosing the proper settings.

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**REFERENCES**


