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**INFLIXIMAB FOR REFRACTORY ULCERATIVE PROCTITIS**

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For Peer Review

## SUMMARY

**Background:** Efficacy of infliximab in treating ulcerative proctitis is unknown.

**Aim:** To evaluate clinical, biological and endoscopic efficacy of infliximab therapy in refractory proctitis.

**Methods:** The charts of 420 patients treated with infliximab for ulcerative colitis were reviewed. Thirteen patients were treated with infliximab for refractory ulcerative proctitis in six referral centers between 2005 and 2009.

**Results:** Following infliximab therapy induction, 9/13 patients (69%) had a complete response (defined as absence of diarrhea and blood), 2/13 (15%) had a partial response and 2/13 (15%) were primary non-responders. The median follow-up was 17 months (range, 3-48). Among the 11 patients with clinical response after infliximab induction therapy, 9 (82%) patients maintained response at last news. Disappearance of rectal disorders was observed in all 9 patients who maintained clinical response at last news. Following infliximab induction therapy, the mean CRP level fell from 12.8 mg/L to 4.7 mg/L. Endoscopic evaluation was performed before and after infliximab in 7 patients, showing an improvement in mucosal lesions in 4 patients, persistent mild endoscopic activity in 2 patients, and no improvement in one patient. One patient underwent proctocolectomy.

**Conclusion:** Infliximab therapy **seems** to be effective in inducing and maintaining clinical response in refractory ulcerative proctitis.

## INTRODUCTION

In population-based studies, ulcerative colitis was confined to the rectum at the time of diagnosis in 22% to 59% of patients.<sup>1-6</sup> The 2-yr, 5-yr and 10-yr cumulative rate of relapse after the first diagnosis was respectively of 42%, 57% and 84% for all patients with ulcerative proctitis (UP) at diagnosis.<sup>7-9</sup> UP may result in distressing symptoms, including stool frequency, tenesmus, urgency and bleeding.<sup>8, 10</sup> Despite the significant benefits of rectally administered aminosalicylates and corticosteroids,<sup>10, 11</sup> some patients with UP and good observance fail to improve and require additional medical therapy.

The management of UP refractory to standard medications remains a challenge in clinical practice, as few data are evidence-based.<sup>10</sup> Several medications have been tested to treat refractory UP. In randomized controlled trials, antibiotics,<sup>12-15</sup> cyclosporine enemas<sup>16</sup> and oral methotrexate<sup>17</sup> were not significantly effective to induce and maintain long-term clinical response and remission. Azathioprine<sup>18, 19</sup> and tacrolimus<sup>20</sup> were more effective than 5-aminosalicylate/mycophenolate mofetil and placebo, respectively, to induce short-term clinical response in refractory ulcerative colitis, but were associated with a higher incidence of adverse events. Intramuscular methotrexate<sup>21</sup> and rectal tacrolimus ointment<sup>22,23</sup> have been assessed in small open labeled studies, with encouraging results that need to be confirmed in large prospective studies. There is a lack of sufficient data or fair results for alternative and miscellaneous treatment including nicotine, heparin, short-chain fatty acid or probiotics.<sup>24-27</sup> Although an invasive procedure, appendectomy has recently shown promising results.<sup>28</sup> Overall, these results remain difficult to interpret due to small sample size and the lack of well-designed published studies supporting their efficacy for refractory UP.

Infliximab (Remicade; Centocor, Malvern, PA), a tumor necrosis factor antagonist, has changed the way of treating inflammatory bowel diseases refractory to standard medications. Two large placebo-controlled, randomized trials, namely ACT 1 and ACT 2, demonstrated

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2  
3 that infliximab is effective to induce and maintain clinical response in ulcerative colitis.<sup>29</sup>  
4  
5  
6 However, patients with UP were excluded from both studies. In a retrospective study of 121  
7  
8 patients treated for ulcerative colitis with infliximab, only 3 patients had UP but were not  
9  
10 specifically studied.<sup>30</sup> **In a prospective pilot study evaluating the efficacy of local tacrolimus**  
11 **for UP, tacrolimus was prescribed for infliximab failure in 4 out of 8 patients.**<sup>23</sup> Recently,  
12  
13 topical administration of infliximab was found to be effective in one patient with chronic  
14  
15 refractory proctitis.<sup>31</sup>  
16  
17

18  
19  
20 Importantly, patients with UP showing an aggressive disease course, with frequently relapsing  
21  
22 proctitis and refractory disease to conventional treatment, are more prone to show proximal  
23  
24 extension at a later date,<sup>7-9</sup> and are colectomized to a higher extent.<sup>2, 8</sup> Because some data  
25  
26 suggest that early aggressive treatment of UP may prevent or delay proximal extension, there  
27  
28 is an urgent need to better evaluate the efficacy of potent therapies such as infliximab in  
29  
30 treating these patients.<sup>32</sup>  
31  
32

33  
34 The aim of this study was therefore to evaluate the long-term outcome of refractory UP  
35  
36 treated with infliximab therapy in a retrospective multicenter study.  
37  
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## 40 41 **METHODS**

### 42 43 **Study population**

44  
45 All hospital records of adult (age > 18 yr) patients treated with infliximab for ulcerative colitis  
46  
47 at 6 tertiary referral centers in France (University Hospitals of Rennes, Nancy, Saint-Etienne,  
48  
49 Nantes, Lyon, and Nice) between January 2005 and September 2009 were reviewed. A  
50  
51 centralized diagnostic index was first used to identify all patients with diagnosis of ulcerative  
52  
53 colitis. The database of these patients with ulcerative colitis was then compared to the  
54  
55 pharmacy records of all patients treated with infliximab at these six hospitals. All adult  
56  
57 patients with documented proctitis refractory to standard medication at first infliximab  
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1  
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3 infusion and an established diagnosis of ulcerative colitis based on clinical, radiological,  
4  
5 endoscopic and/or histological evidence were included. Proctitis was defined according to the  
6  
7 Montreal classification.<sup>33</sup>

8  
9  
10 Infiximab was administered initially at a dose of 5 mg/kg as a 2-h i.v. infusion. Following  
11  
12 infiximab induction therapy, which consisted of 3 infusions at weeks 0, 2, and 6, the patients  
13  
14 received various infiximab regimens, depending on the preferences of each treating  
15  
16 physician. Maintenance treatment was individually tailored by treating physicians. Scheduled  
17  
18 maintenance treatment was defined as if infiximab was intentionally planned every 8  
19  
20 weeks.<sup>30, 34, 35</sup> All concomitant medications were recorded, and medication was included in the  
21  
22 analysis only if total drug exposure was superior to 3 months after first infiximab infusion.  
23  
24

25  
26 All adverse events occurring during or after the first infiximab infusion and until last news  
27  
28 were collected. Acute infusion reactions were defined as any adverse event that occurred  
29  
30 during or within one hour after the infusion of infiximab.<sup>30, 34, 35</sup>

31  
32 All endoscopic and clinical reports mentioning the evolution of UP after first infiximab  
33  
34 infusion were reviewed.

35  
36 Short-term and long-term clinical responses were evaluated as previously described.<sup>30, 34, 35</sup>

37  
38 The “short-term response” was defined as the result of induction therapy with infiximab and  
39  
40 “long-term response” was defined as clinical efficacy at the maximal follow-up. Both short-  
41  
42 and long-term clinical responses were defined as complete in the absence of diarrhea and  
43  
44 blood and if a steroid-sparing effect was noted, and partial if there was marked clinical  
45  
46 improvement but still persistent rectal blood loss.<sup>30, 36</sup> To assess rectal disorders, we also  
47  
48 recorded the presence of stool urgency, incontinence, tenesmus and rectal pain at first  
49  
50 infiximab infusion and during the follow-up. Rectal disorders were considered as “present” if  
51  
52 one of these items was reported, while rectal disorders were defined as “absent” if none was  
53  
54 recorded.  
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3 To assess endoscopic activity of proctitis, three levels of activity were defined: (1) normal, (2)  
4 mild with erythema, friability erosion and lack of spontaneous bleeding, and (3) severe with  
5 ulceration and spontaneous bleeding.<sup>29</sup>  
6  
7  
8  
9

### 10 11 12 **Statistical analysis**

13  
14  
15 Owing to small sample size, statistical analysis was limited to descriptive statistics.  
16  
17 Quantitative variables were described as mean  $\pm$  standard deviation (SD) and categorical  
18 variables were presented as counts and percent of the cohort.  
19  
20  
21

## 22 23 24 **RESULTS**

### 25 26 27 **Baseline characteristics of the patients**

28  
29 A total of 420 patients were treated with infliximab for ulcerative colitis at the six referral  
30 centers between January 2005 and September 2009. A total of 13 patients were treated with  
31 infliximab for refractory UP. The baseline characteristics at first infliximab infusion are  
32 indicated in Table 1. The mean age of our population was 47 years (SD=12.7; range, 27-66)  
33 and the mean duration of UP was 5.4 years (SD=6.9; range 0.2-22.2). Except for patient 2  
34 who had a corticoid-dependent disease, all patients had active UP with diarrhea and/or bloody  
35 stools. All patients also had rectal disorders at time of first infliximab infusion.  
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45  
46 Only one patient was an active smoker at baseline. One patient had extra-intestinal  
47 rheumatologic disease. One patient had prior intestinal surgery that was not related to  
48 ulcerative colitis and consisted in a sigmoidectomy for diverticular disease performed 10  
49 years before the diagnosis of ulcerative colitis.  
50  
51  
52

53  
54  
55 Of the 13 patients, 11 (85 %) had been treated with immunosuppressants (thiopurine,  
56 methotrexate) before starting infliximab. Two patients had prior exposure to intravenous  
57 corticosteroid therapy, and two patients had received cyclosporine before infliximab  
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59  
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1  
2  
3 initiation. All patients had received prior rectal 5-aminosalicylate and prior oral corticosteroid  
4  
5 therapy.  
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9

### 10 **Infliximab therapy and concomitant medications**

11  
12 Infliximab was prescribed for UP refractory to both rectal 5-aminosalicylate and oral  
13  
14 corticosteroid therapy in all 13 patients, and UP was also refractory to immunosuppressants in  
15  
16 11 patients.  
17

18  
19 All patients received induction therapy with 3 infliximab infusions at weeks 0, 2 and 6. Four  
20  
21 out of 13 patients (15%) received only infliximab induction therapy, while the 9 remaining  
22  
23 patients (85%) had scheduled infliximab treatment. In these patients, the mean number of  
24  
25 infliximab infusions after induction therapy was 7 (S.D. =8.6; range, 1-25).  
26  
27

28  
29 Concomitant medications at infliximab therapy initiation are summarized in Table 2. A total  
30  
31 of 8 patients were treated with concomitant immunosuppressants and 6 patients had  
32  
33 concomitant corticosteroid therapy.  
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36  
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### 39 **Short-term clinical and biological efficacy (Table 2)**

40  
41 Short-term efficacy could be assessed for all 13 patients. Two out of 13 patients (15%) were  
42  
43 judged as primary non-responders. One primary non-responder had no concomitant treatment,  
44  
45 while the other one was receiving concomitant oral corticosteroid at the time of infliximab  
46  
47 initiation. A total of 11 out of 13 (85%) patients experienced clinical improvement after  
48  
49 treatment with infliximab: complete clinical response was observed for 9 out of the 11  
50  
51 patients (82%) and a partial response for two subjects (18%). All subjects (n=8) with  
52  
53 concomitant immunosuppressant had a clinical response, which was judged as complete in 6  
54  
55 out of the 8 patients. Rectal disorders were improved in 9 out of the 11 primary responders  
56  
57  
58 (82%).  
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3 Following infliximab induction therapy, the mean C-reactive protein (CRP) level fell from  
4  
5 12.8 mg (S.D. =15.1; range, 1-55) to 4.7 mg (S.D. =4.1; range 0.6-12; data available at  
6  
7 baseline and after induction therapy in 10 of 13 patients).  
8  
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### 10 11 12 **Long-term outcome: clinical, biological and endoscopic responses**

13  
14 Information regarding long-term follow-up was available for all patients (n=13). After a  
15  
16 median follow-up of 17 months (SD 13 months; range 3-48), the evaluation of clinical activity  
17  
18 at last news revealed a partial (n=2) or complete (n=7) clinical response in 9 of the 11 primary  
19  
20 responders (82%). Of note, rectal disorders disappeared in all 9 patients.  
21  
22

23  
24 The 4 remaining patients had symptomatic disease at last news, including the 2 patients who  
25  
26 were considered as primary non-responders. Both of these patients (Patients 5 and 10) were  
27  
28 being treated with oral corticosteroid at last news. Two patients (Patients 2 and 8) who were  
29  
30 considered as primary responders lost response to infliximab over time and were secondary  
31  
32 non-responders: one patient treated with scheduled infliximab therapy without concomitant  
33  
34 immunosuppressant had a disease extension to **left-sided** colitis after discontinuation of  
35  
36 corticosteroid therapy and finally underwent proctocolectomy (Patient 2). The other one  
37  
38 (Patient 8) had complete short-term clinical response with disappearance of diarrhea and  
39  
40 blood in stools, but as patient 2 had a persistent rectal disorder after infliximab induction  
41  
42 therapy. This patient had an early relapse after infliximab induction therapy and did not  
43  
44 experience any clinical improvement despite infliximab optimization by dose escalation at the  
45  
46 fourth infusion. Treatment was changed to oral tacrolimus and methotrexate without any  
47  
48 response on clinical disease activity or rectal disorder.  
49  
50

51  
52 Among the 8 patients who were primary responders and had concomitant immunosuppressant  
53  
54 at baseline, 7 patients had maintained their clinical response without any rectal disorder at last  
55  
56 news.  
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3 During follow-up, infliximab optimization was necessary in 3 patients. Two patients (patients  
4  
5 1 and 9) had a complete clinical response at last news, whereas the third one (Patient 8) had  
6  
7 not experienced any improvement in clinical symptoms despite dose escalation and was  
8  
9 considered a secondary non-responder.  
10

11  
12 At last news, the CRP level was available for 7 patients. When including all 7 subjects in the  
13  
14 analysis, the mean CRP level was 14.4 mg/L (S.D. = 22.2; range 0.5-59). Excluding primary  
15  
16 non-responders did not influence this result, with a mean CRP level of 14.1 mg/L (S.D. =25.2;  
17  
18 range 0.5-59). When excluding both primary and secondary non-responders, the mean CRP  
19  
20 level was only 2.9 mg/L (S.D. =2; range 0.5-5).  
21  
22

23  
24 All patients had endoscopic evaluation at baseline. During follow-up, 7 patients also had  
25  
26 endoscopic evaluation of the rectum after infliximab initiation. This showed an improvement  
27  
28 in mucosal lesions in 4 patients (complete mucosal healing in 2 patients and mild endoscopic  
29  
30 activity in 2 patients), stable endoscopic lesions with persistent mild endoscopic disease in  
31  
32 two patients, and persistent severe rectal disease in one patient, as defined above.  
33  
34 Interestingly, endoscopic response was generally associated with clinical response: the two  
35  
36 patients with complete mucosal healing at last news who had severe (patient 4) and mild  
37  
38 (patient 13) lesions at infliximab initiation were in clinical response at last news, whereas  
39  
40 patient 12 with severe mucosal lesions persisting after infliximab induction therapy was a  
41  
42 secondary non-responder to infliximab therapy. The 4 remaining patients had mild endoscopic  
43  
44 activity at last news: patients 1 and 9, who respectively had severe and mild endoscopic  
45  
46 lesions at time of infliximab initiation, had a complete clinical response at last news. Hence,  
47  
48 there was a discrepancy between endoscopic and clinical response in only two patients:  
49  
50 patients 5 and 8, who respectively had severe or mild endoscopic lesions at baseline, were  
51  
52 primary and secondary non-responders at last news despite mild endoscopic activity after  
53  
54 infliximab therapy initiation.  
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### Adverse events

Infliximab infusions were generally well tolerated. None of the 13 patients had any acute infusion reaction. Only two patients experienced adverse events. One developed psoriasiform lesions leading to infliximab discontinuation. The other developed several infections, with **left-sided** diverticulitis and bursitis of the knee. He was treated with concomitant immunosuppressant and oral steroid therapy. Both infections had a favorable outcome after administration of broad-spectrum antibiotics, so infliximab therapy could be continued. No opportunistic, tuberculosis infections, malignancies or lymphoma were observed throughout the follow-up period.

### DISCUSSION

This study shows for the first time that infliximab treatment may be effective for both induction and maintenance of clinical response in refractory UP.

Two randomized trials, namely ACT 1 and ACT 2, demonstrated the efficacy of infliximab in ulcerative colitis, but UP were excluded from both studies<sup>29</sup>, whereas the monocenter retrospective study from Leuven did not specifically report the outcome of 3 patients with UP treated with infliximab.<sup>30</sup>

Following infliximab induction therapy, 11 out of 13 (85%) patients experienced clinical improvement after treatment with infliximab, with 9 of the 11 (82%) also experiencing improvement in rectal disorders. Long-term outcome showed a complete clinical response for half of the patients with refractory UP. These results are in line with previous reports showing a clinical response in patients with pancolitis or **left-sided** colitis treated with infliximab at short term in about 63-69.4% of patients and at long term in 38.8-43% of patients.<sup>29, 30</sup> Of note, 9 of the 11 primary responders maintained a complete response at maximal follow-up,

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2  
3 as judged by disease activity and the absence of rectal disorders. This finding is also  
4  
5 consistent with that obtained in a large monocenter retrospective study evaluating infliximab  
6  
7 in left-sided and pancolitis, and showing that 68% of patients with initial response to  
8  
9 infliximab had sustained clinical response during follow-up.<sup>30</sup> Because infliximab efficacy for  
10  
11 UP was broadly similar to that reported for left-sided colitis and extensive colitis, our results  
12  
13 suggest that UP may be included in large international clinical trials evaluating the efficacy of  
14  
15 anti-TNF agents in ulcerative colitis.  
16  
17

18  
19 Interestingly, clinical response was accompanied by a decrease in CRP levels and an  
20  
21 improvement in endoscopic lesions of the rectum. The drop in CRP levels is a known factor  
22  
23 associated with clinical response in ulcerative colitis.<sup>30</sup> Mucosal lesions were improved in 4 of  
24  
25 the 7 patients with endoscopic assessment after infliximab initiation, thus confirming the  
26  
27 efficacy of infliximab therapy in this indication.  
28  
29

30  
31 Meucci et al. reported that 14% of patients with UP presented one or more features consistent  
32  
33 with a refractory disease, indicating that, in some patients with UP, the disease course is not  
34  
35 as mild as generally assumed.<sup>8</sup> This aggressive course was associated with an increased risk  
36  
37 of proximal disease extension and finally colectomy.<sup>2, 8</sup> In our series, only one patient  
38  
39 relapsed after infliximab induction: he progressed to pancolitis and finally underwent  
40  
41 proctocolectomy. Of note, the safety profile of infliximab was consistent with previous  
42  
43 experience with this drug in UC.<sup>29, 30, 34</sup> Overall, these results indicate that infliximab may be  
44  
45 effective in treating refractory UP.  
46  
47  
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51 We were not able to look for predictors of response to infliximab due to small sample size.  
52  
53 Despite this limitation, patients with concomitant immunosuppressant administration seemed  
54  
55 to have higher rates of clinical response and a longer duration of response to infliximab.  
56  
57 Another limitation is the lack of control arm. However, the rates of response to placebo in  
58  
59 patients with severe and resistant ulcerative colitis in randomized control trials are low,  
60

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3 ranging from 10 to 33% at short term and from 6.6 to 14% in the long term.<sup>20, 29</sup> In addition,  
4  
5 only patients who had active disease despite treatment with conventional therapy, including  
6  
7 local aminosalicylate and corticosteroid therapy, were included in the study.  
8  
9

10 Importantly, the median follow-up was 17 months. A long-term follow-up is required to  
11  
12 assess the sustained efficacy of medical treatment in refractory UP, which is known to relapse  
13  
14 frequently, and because refractory disease is more prone to having a complicated outcome.<sup>8, 9,</sup>

15  
16  
17 <sup>14</sup> Furthermore, this was a multicenter study. Infliximab therapy is rarely used to treat UP in  
18  
19 clinical practice. By screening a total of 420 patients treated with anti-TNF therapy for  
20  
21 ulcerative colitis at 6 referral centers in France, we were able to identify and analyze the  
22  
23 data of 13 patients. Finally, because of the retrospective study design and the inherent bias in  
24  
25 interpreting clinical response on medical records, we decided to assess clinical response not  
26  
27 only by using the judgment of the treating physician but also by recording the presence or not  
28  
29 of objective Mayo criteria such as diarrhea and blood in the stools.<sup>30, 36</sup> In addition, the  
30  
31 absence of rectal disorders was defined as the absence of all predefined items, namely stool  
32  
33 urgency, incontinence, tenesmus and rectal pain.  
34  
35  
36  
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38 Collectively, our findings indicate that infliximab may be effective and safe in inducing and  
39  
40 maintaining a clinical response in patients with refractory UP. It is unlikely that a randomized  
41  
42 controlled trial will ever be carried out to evaluate the efficacy of infliximab in refractory UP.  
43  
44 However, because of the retrospective study design of our study and small sample size,  
45  
46 infliximab efficacy in treating ulcerative proctitis needs to be confirmed in larger prospective  
47  
48 studies. Pending these results, infliximab should be used only in patients with disease  
49  
50 refractory to all available medications. The optimal drug regimen as well as the optimal  
51  
52 duration of treatment remain to be determined.  
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Table 1: Baseline characteristics of 13 patients with refractory ulcerative proctitis.

Patient No.	Sex	Age (yr)	Disease duration (months)	Previous surgery	Previous treatment		Number of bowel movements/ 24 hours	Presence of bloody stools*	Rectal disorders	Endoscopic activity
					Enema, ointment, suppository	Systemic medications				
1	M	61	267	NO	ASA	ASA,CS, IS, Cyclo	6	Severe	Present	Severe
2	M	46	131	NO	ASA	ASA,CS, IS	4	None	Present	Normal
3	M	65	45	NO	ASA, CS	ASA,CS, IS	6	Mild	Present	Mild
4	M	31	24	NO	ASA	ASA,CS, IS	10	Severe	Present	Severe
5	M	55	195	NO	ASA, CS	ASA,CS, IS	15	Severe	Present	Severe
6	M	54	75	NO	ASA	ASA,CS, IS	15	Severe	Present	Severe
7	M	42	12	NO	ASA	ASA,CS	10	Mild	Present	Mild
8	M	28	12	NO	ASA, CS	ASA,CS, IS, Cyclo	3	Mild	Present	Mild
9	M	37	3	NO	ASA, CS	CS, IS	2	None	Present	Mild
10	M	26	44	NO	ASA, CS	ASA,CS	20	Mild	Present	Mild
11	M	54	7	Sigmoidectomy	ASA, CS	ASA, CS, IS	8	Severe	Present	Severe
12	F	55	4	NO	ASA, CS	ASA,CS, IS	8	Severe	Present	Severe
13	M	42	29	NO	ASA, CS	ASA,CS, IS	6	Severe	Present	Mild

M, Male; F, female; yr, years ; IFX, infliximab; ASA, aminosaliclylate; IS, immunosuppressant (azathioprine, 6 mercaptopurine, methotrexate); CS, corticosteroid; Cyclo, cyclosporine  
\*As judged by their physician.



Table 2: Short-term and long-term responses to infliximab in the 13 patients with refractory ulcerative proctitis.

Patient No.	Number of IFX infusions	Short-term response			Follow-up (months)	Maintenance treatment (IFX)	Long-term response		Endoscopy at last news	Treatment at last news
		Concomitant medications	Clinical response	Rectal disorders			Clinical response	Rectal disorders		
1	17	ASA, IS	Complete	Absent	28	YES	Complete	Absent	Mild	IFX
2	4	ASA, CS	Complete	Present	21	YES	Absent	-	-	Procto-colectomy
3	4	None	Complete	Absent	5	YES	Complete	Absent	-	IFX
4	18	CS, IS	Complete	Absent	28	YES	Complete	Absent	Complete mucosal healing	IFX
5	3	CS	Absent	Present	29	Primary non responder	Absent	Present	Mild	CS
6	6	CS, IS	Partial	Absent	12	YES	Complete	Absent	-	IFX
7	4	ASA	Complete	Absent	3	YES	Complete	Absent	-	IFX
8	4	IS	Complete	Present	9	YES	Absent	Present	Mild	Tacrolimus IS
9	28	CS, IS	Complete	Absent	48	YES	Complete	Absent	Mild	IFX, IS
10	3	None	Absent	Present	6	Primary non responder	Absent	Present	-	CS
11	3	ASA, IS	Partial	Absent	6	NO	Partial	Absent	-	IFX
12	3	CS, IS	Complete	Absent	18	NO	Partial	Absent	Severe	ADA*, CS, IS
13	9	ASA, IS	Complete	Absent	12	YES	Complete	Absent	Complete mucosal healing	IFX

IFX, infliximab; ASA, aminosalicilate; IS, immunosuppressant (azathioprine, 6 mercaptopurine, methotrexate); ADA, adalimumab  
 \*Switch from infliximab to adalimumab due to patient preference.

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