

Intravesical Formalin for the Control of Intractable Bladder Haemorrhage Secondary to Radiation Cystitis or Bladder Cancer

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Summary. During the last two years, 17 patients with haemorrhage due to radiation cystitis or bladder cancer have been treated by intravesical infusion of 10% Formalin solution. The results were very good in 9 cases, satisfactory in 3, while the remaining 5 cases were disappointing. The control of bleeding by Formalin was safe especially in patients with secondary haemorrhage due to radiation cystitis with no tumour recurrence.

Secondary bleeding due to radiation cystitis, bladder cancer or chemically induced cytotoxicity (cyclophosphamide) can very often be a frustrating and clinically difficult problem to manage. In 1969 Brown described the effect of Formalin in the control of Urinary bladder haemorrhage secondary to advanced cancer (1). Since then many improvements and modifications have been made. These efforts at improved control are evidence of the difficulties and problems encountered in the management of such haemorrhage.

When the routine regime of fulguration, continuous irrigation and Haemostatic drugs does not control the bleeding, the choice of further treatment is limited. We report an experience with intravesical Formalin.

MATERIALS AND METHOD

Intravesical Formalin was used in 17 patients, 14 males and 3 females ranging from 64-80 years. Twelve patients had suffered from large haemorrhages, while five were less severe but continuous. Haemorrhage was due to advanced cancer in 5 cases, to advanced radiated bladder tumour in 6 cases and radiation cystitis in the remaining 6 cases (Table 1).

Prior to resorting to intravesical Formalin, cystoscopic fulguration (often repeated) continuous irrigation with various room temperature and refrigerated solutions, systemic or topical epsilon aminocaproic acid and hypertronic glucose had been used in an effort to control the bleeding.

On 5 patients bilateral cutaneous ureterostomies had been performed prior to Formalin treatment, while in 3 cases the diversion was performed a long time after Formalin infusion. Cutaneous ureterostomies were performed in order that the bleeding could be controlled, more easily except in 3 cases where there was infiltration of a ureteric orifice by tumour. Performance of the cutaneous ureterostomies was combined with ligation of the internal iliac arteries.

The method used was that described by Brown (1) and Firlit (2). Either general or spinal anaesthesia is necessary for Formalin instillation. Clots and necrotic tissues were removed. Cystoscopy was performed and obvious bleeding points controlled by fulguration. An 18 F.G. catheter was inserted and 100 ml to 150 ml of 10% Formalin instilled into the bladder at 15 cm pressure.

Traction was applied to the catheter during the infusion to avoid any leakage of Formalin into the posterior urethra. The catheter was clamped for 15 minutes, allowed to drain, and then irrigated with normal saline. The catheter was removed after 6 days.

Preoperative history, physical examination, haemoglobin, haematocrit, blood urea nitrogen, creatinine, calcium, phosphorus, serum protein, bilirubin, alkaline phosphatase, serum glutamic and oxaloacetic transaminase, lactic dehydrogenase, electrolyte and coagulation profile, excretory urograms and micturating cystogram to rule out vesicoureteral reflux were obtained on all patients.

Table 1

Bladder tumour	5 cases
Radiation cystitis - bladder tumour	6 cases
Radiation cystitis	6 cases

Table 2

Results		
Very good	9 cases 52,2% (6 Radiation cystitis, 3 cystitis-bladder tumour)	
Satisfactory	3 cases 17,4% (3 Radiation cystitis-bladder tumour)	
Unchanged	5 cases 29% (Bladder tumour)	

Table 3

Complications	No.	%
Tachycardia	16	94%
Urinary infection	1	5,8%
Stroke	1	5,8%

RESULTS

The results were classified, in terms of control of bleeding, into three groups.

- A` Very good 52,2% (9 cases).
- B` Satisfactory 17,4% (3 cases).
- C` Unchanged 29,4% (5 cases). (Table 2).

It must be emphasised that the results in the cases with radiation cystitis were 100% successful.

These results were obtained after one instillation in 9 cases while in the remaining 8 a second instillation was necessary. Gross bleeding ceased within 12-24 hours after infusion and continued for a period of 4 to 5 months. Four out of five patients with disappointing results died within 2 to 4 weeks of progressive bladder cancer. Bladder capacity remained unchanged. Microscopic haematuria persisted in all patients.

No significant complications were noticed, however 16 patients (94%) developed tachycardia lasting for two hours beginning two hours after the instillation.

One patient developed urinary infection, while another had a stroke 12 h postoperatively. It was noted that this latter patient had developed hypertension within the immediate postoperative hours (Table 3).

DISCUSSION

The effect of Formalin solution on canine urinary bladder mucosa has been reported by Whittaker and Freed (3). These authors did not observe any systemic effects of Formalin, no evidence of upper tract damage or ureteric obstruction, Serum electrolytes and blood urea nitrogen remained normal. The authors described a case whose haematuria appeared to be exacerbated after the first postinstillation cystogram. The excessive bleeding in this animal may have been promoted by over distension of a weakened bladder, as suggested by the extravasation of contrast medium.

Serial biopsies of bladder mucosa one week after Formalin instillation show a grey urothelium with blackened areas of haemorrhage and necrosis. Microscopically the urothelium is entirely disrupted with almost a complete lack of normal urothelial cells. There is an intense inflammatory reaction with the deposition of an amorphous, almost cellular substance below the urothelium. The subepithelial tissues show multiple telangiectasia and what appears to be young fibroblasts.

At 1 month, there is a normal appearance on gross inspection. At 6 months the normal bladder urothelium is again seen with a regular arrangement of urothelial cells. At 1 year a basically normal appearance is shown.

We have concluded that the method described was safe and easy to use. It is a good method of controlling secondary haemorrhage in radiation cystitis and would constitute a useful haemostatic treatment for bleeding bladder tumours prior to radical surgical treatment.

REFERENCES

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