PARAQUAT POISONING BY SUBCUTANEOUS INJECTION

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Introduction: Paraquat poisoning reports by parenteral injection are rare in the literature. Only two cases of subcutaneous injection of paraquat have been reported since 1966. We present a third report of this route of paraquat poisoning that received multimodal therapies.

Case presentation: A 47-year-old female presented 3 hours after 3-4 milliliter subcutaneous injection of 20% w/v of paraquat ion into her left distal forearm (Figure). A greenish area around the injection site was noted with surrounding moderate oedema. Urine dithionite test (UDT) turned dark purple which confirmed significant paraquat exposure. Other labs were remarkable for an elevated serum creatinine (Cr) and extremely high concentrations of paraquat (Table). At 6.5 hours post injection, the following was started, cyclophosphamide 5 mg/kg/day IV, dexamethasone 10 mg IV every 8 h, vitamin C 6 g/day, and vitamin E 3200 IU/ day. At 8.5 hours post injection, the patient underwent haemodialysis for 2 hours. After 10.5 hours, surgery performed a tissue excision to remove any retained paraquat in the surrounding tissue. At 14 hours, we started the first 8 hour course of Molecular Absorbent Recirculating System (MARS) therapy because it contains an activated charcoal column in the MARS and haemoperfusion was unavailable.

Table. Laboratories and results on the patient by date and time

Date	Time (hours post injection)	Renal Function Test		Liver Function Test				Urine Dithionite Test	Paraquat Concentration (microgram/milliliter)		
		BUN	Cr	AST	ALT	TB	DB		Serum	Blood	Urine
Day 1	0737 (3.5)	10	1.7	28	12	0.6	0.1	+	102.0	–	10,158.0
Day 2	0415 (24.3)	14	2.5	595	206	2.1	1.8				
	0900 (29.0)							+			
	2000 (40.0)								1.8	1.8	13.4
Day 3	0508 (49.1)	25	3.5	360	351	2.0	1.4				
	1352 (58.0)	35	4.4					–	1.3	1.3	0
	1900 (63.0)	43	5.1								
Day 4	0438 (72.5)	53	7.4	307	338	3.1	2.4				

On day 2, her Cr was elevated and UDT was still positive, MARS was then repeated for another 8 h (at 35.5 h). Because of the rise in liver function tests, IV N-acetylcysteine was administered. On day 3, oliguric renal failure developed. UDT was negative which corresponded with the urine paraquat concentration of 0 mcg/ml. Pulmonary oedema also developed and complicated her hospital course. On day 4, her kidney and pulmonary function markedly deteriorated. Despite resuscitation, she expired 77 hours after the injection. The autopsy revealed pulmonary haemorrhage and oedema, acute tubular necrosis, necrotising fasciitis of the left forearm and toxic hepatitis.

Conclusions: Self harm by subcutaneous injection of paraquat is extremely rare. Usually, ingestion of greater than 20 ml of 20-30% w/v paraquat leads to severe respiratory dysfunction and multiorgan failure. This patient injected only a few milliliters of paraquat, yet had a fatal outcome despite advanced multimodal treatments. This can be explained by the high bioavailability of the parenteral route compared to the oral route which has a bioavailability of 5% or less.

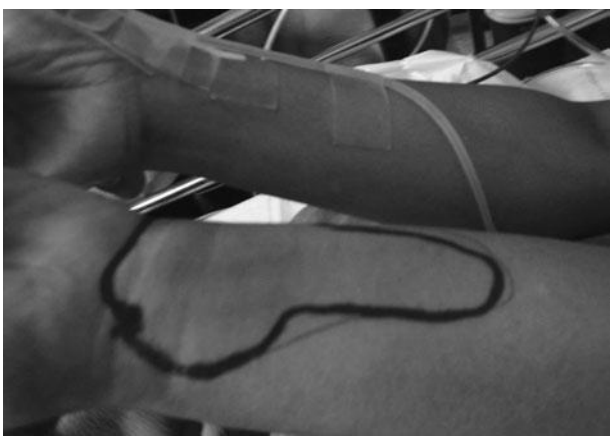

Figure. The injection site and surrounding edematous area of the left forearm, compared with her normal right forearm