



Reactionary Hemorrhage Following Elbow Deformity Correction

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Abstract

Introduction : Kirschner wires (K-wires) are tremendously versatile in fracture fixation in the pediatric population. Reactionary post-operative hemorrhage is a rare unusual complication not been previously cited in the literature till date.

Case Scenario: Child with left cubitus varus deformity was treated with corrective osteotomy with Kirschner wires, planned removal after 6 weeks. Immediately following removal ended up with uncontrollable bleeding for 2 days.

Conclusion: Reactionary hemorrhage is a rare complication, despite all meticulous surgical technique and attention to detail, few unpredicted unforeseen complications still remain a chance

Keywords: K -wire; supracondylar fracture; cubitus varus; reactionary hemorrhage

Introduction

Supracondylar fractures are one of the most common traumatic fractures observed in children between age 4 - 7 years following fall on outstretched hand. Malunion of such fractures leads to cubitus varus or gunstock deformity of elbow which initially a cosmetic problem on further neglecting leads to neurological and functional compromise of the upper limb in later years. Corrective osteotomy is the preferred method with highest probability of success. Literature review shows complications more of fracture specific than implant specific. Studies associated with K-wire fixation in children regardless of their specific anatomical location were minimal. This case report highlights on focussing the unexpected reactionary hemorrhage in a pediatric patient with a cubitus varus deformity, which occurred after deformity correction.

Case Scenario:

A 3 year old female child accompanied by her parents visited SRIHER Orthopaedic outpatient department on September 2020 with parents complaining of deformity in left elbow. Past history includes fall sustaining injury to left elbow underwent 2 cycles of native splinting 15 days each, parents noticed deformity over her left upper limb after removal of native splinting, no history of pain or limitation of movements and no preexisting comorbidities or history of bleeding disorders. Xrays were taken diagnosed of malunited left humerus supracondylar fracture with cubitus varus deformity. A lateral based closed wedge corrective osteotomy was performed with 3 Kirschner wire fixation (2 medial and 1 lateral) under general anesthesia. Post-

operative period was uneventful, dressing clean and intact, discharged on second post-operative day.

6 weeks of post surgery, with satisfactory signs of bone healing, elective removal of Kirschner wire was done under general anaesthesia, 1 cm incision was made to remove the lateral k-wire as it was kept under the skin, rest two k-wires were bent and kept outside the skin, hence were removed without incision. Child was shifted to paediatric ward for further observation and was started on orals and feeds from evening 6 pm onwards. Eight hours following the procedure got call from paediatric ward staff on complete soakage of dressing and extending to bedspread and parents being panic of soakage, initially padding and compression bandage was applied but soakage continued. Operated arm was kept on pillow cover elevation on bedside stand. Dressing was changed twice within a span of 2 hours due to continuous soakage. Dressing was then removed and wound site was inspected, mild continuous dark colour bleed was noted oozing from the proximal lateral Kirschner wire removal site, which continued for a period of 18 hours in spite of continuous compression padding over the area and pillow cover elevation. Throughout the period, child was clinically painfree, afebrile and comfortable, the surgical site was otherwise clean with sutures intact. Vascular surgery opinion was obtained immediately, bedside doppler was performed and was found to be insignificant.

Paediatrician opinion was sought and history discussed from the day of presentation to current situation as of cause remains a mystery. A complete coagulation profile was performed. All bloodline parameters and coagulation factor were inconclusive. In due course, injection tranexamic acid 150 mg iv infusion thrice daily for 1 day, soakage and ooze was minimised following 18 hours. Child was discharged on 2nd day with advise for wound inspection and suture removal. Child was followed-up post-operative day 5, 12 and 18 with no further episodes of bleeding. Suture removal was done at post-operative day 12, wound was clean, no gaping and

discharge was noted. Besides all efforts and clinical measures taken, cause of the bleed till remains unclear.^(Figure-1,2,3)

Discussion

Cubitus varus or gunstock deformity as it is commonly known is the most common complication of displaced supracondylar fractures in children with an incidence ranging from 3% to 57%. Various types of osteotomies have been described each claiming improvements in cosmesis as well as lesser complication rates with other techniques. In our patient, a lateral closing wedge osteotomy was performed along with K-wire fixation. Smooth Kirschner pin fixation is a common and very versatile method of internal fixation of paediatric fractures.^(1,2,3,4) Complications associated with the K-wire insitu fixation vary from minor to life-threatening.^(5,6) Minor and uncommon complications could also be of important due to factors like parental anxiety and prolonging patient recovery; however, they were minimal or under-reported. In our patient, we observed a sudden onset reactionary hemorrhage, 6 hours after surgery. Timely observation with early clinical evaluation and medical management with local remedial measures eventually minimised and stopped the ooze from surgical site.^(7,8)

Conclusion

Reactionary hemorrhage following Kirschner wire removal remains a rare occurrence and not previously cited in the literature. Besides all proper surgical technique, and attention to detail, unpredicted unknown unforeseen complications still exists. From our case report we experienced, that such a complication is possible from a trivial surgical procedure like K-wire removal and not to be taken lightly. A complete blood work-up to rule out any coagulation disorder specially in children of consanguineous marriage is of utmost importance and an emergency doppler to rule out vascular injury at earliest could be limb and life saving.

Clinical message

1. This case report, highlights to all trauma surgeons that a simple k -wire fixation and removal, the most commonly done procedure on regular basis as daycare or outpatient could also turnout to be a nightmare at anytime.
2. Surgeons working in an average clinic setup, without much assess to blood banks and resources of manpower availability might end up facing ethical / medicolegal issues. Now its hightime to be a cautious and watchful for

uncommon complications even for most commonly done procedure in the future days.

- Principles of management, early recognition and timely intervention on uncommon situations with close monitoring of the patient in a high-dependency unit, counselling and educating parents / patient attenders on uncommon situation, will aid in smooth handling and ease of situation from going out of control.

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Figure - 1



Figure-2

ResDate	Test Name	Result	BiologicalReference Interval	Unit
CLINICAL PATHALOGY				
02/11/2020	CBC (HB,TC,DC,PCV,RBC,PLT,MCV,MCH,MCHC)	-		
	HAEMOGLOBIN	9.5	11-14	gms/dl
	TC	10800	5000-17000	cells/cumm
	POLY	41.6	30-40	%
	LYMNH	49.3	25-45	%
	EOS	2.5	1-6	%
	MONO	6.0	2-10	%
	BAZO	0.6	0-1	%
	RBC COUNT	4.66	4-5.2	mill/cc.mm
	PLATELET COUNT	4.59	2-4.9	lakhs/cumm
	PCV	29.8	34-40	%
	MCV	63.9	75-87	FL
	MCH	20.3	24-30	PG
	MCHC	31.8	31-37	
	PTT (PARTIAL THROMBOPLASTIN TIME)	27.1	22.2-30.4	seconds
	CONTROL	26.3		
	PROTHROMBIN TIME (PT)	11.6	10.9-13.1	seconds
	CONTROL (ANPT)	12.0		
	INR	1.00	0-0	

Figure - 3

COMPLETE COAGULATION WORKUP		
Sample: Citrated plasma		
PARAMETER	TEST	BIOLOGICAL REFERENCE RANGE
PT (clot based)	12.7	11-13.4 Sec
PT Mix	-	
Factor VII (clot based)	68.4	70-150%
Thrombin Test (clot based)	17.5	16.4-18.8 Sec
APTT (clot based)	21.6	20.6-30.6 Sec
APTT Mix	-	
Factor VIII (clot based)	120.9	70-150%
Factor IX (clot based)	85.4	70-120%
VWF (immunoturbidometry)	117.9	47.8-173.2%
Factor V (clot based)	92.6	70-120%
Factor II (clot based)	65.2	70-120%
Factor X (clot based)	65.2	70-120%
Factor XI (clot based)	108.5	70-120%
Factor XII (clot based)	100.1	70-120%
Fibrinogen (clot based)	192.0	250-520 mg/dl
Factor XIII screen (manual)	Negative	Negative
Lupus anticoagulant (dRVVT method)	-	ABSENT
History of bleeding :	one episode of bleeding from K wire exit.	
Family History :	Nil	
Platelet count :	4.59 lakhs/cumm	
Morphology :	Normal	
Impression :	Coagulation profile within normal range.	
Remark :	-	
** End of Report **		