Management of Life Threatening Hemorrhage from Facial Fracture

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Persisted bleeding from facial fractures after nasal packing or direct pressure is not common, however if it happens, the mortality rate is very high. The study of the treatment for this group of surviving patients was made to find the guideline for management of these patients. From the period of 1 January 1993 to 31 December 2002, 3756 cases of facial fractures were treated at the Trauma Center, Faculty of Medicine Siriraj Hospital. There were 14 life-threatening hemorrhage cases and 9 patients survived. They were 3 Le Fort fracture, 2 nasal fracture, 1 mandibular fracture and 3 multiple facial fractures. Repacking of nasal cavities was performed and was able to stop bleeding successfully in 2 cases. Three cases required operation and 3 cases had angiography and embolization. One case still bled after operation and needed angiography and embolization. The present study shows that the adequacy of nasal packing or wound compression should be evaluated first. Early operation could stop bleeding in nearly half of the cases. Angiography and embolization can be used alone or adjunct to the operation to control bleeding with good result.

Keywords: *Life-threatening hemorrhage, Facial fracture, Maxillofacial injury*

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Facial fracture resulting in severe bleeding is uncommon[1,2]. When it does occur, in most cases it can be controlled by suturing, compression at the fracture site or packing[3]. Rarely, bleeding can persist and progress to shock, even after all the above interventions have been attempted[4]. Because of this rare clinical phenomenon, many hospitals have little or no experience treating these patients resulting in very high mortality rate among these patients. Faculty of Medicine Siriraj Hospital is a tertiary care and trauma center which receives more than 50 referred trauma cases every month. Over the last 10 years, the center had 14 cases of persistent bleeding due to facial fracture after primary interventions. Treatment and complications of the survivors were assessed for improving management protocols in the future.

Material and Method

The medical records of facial fracture during the period of 1 January 1993 to 31 December 2002 at the Division of Trauma Surgery, Department of Surgery, Faculty of Medicine Siriraj Hospital were studied. Cases with severe bleeding, uncontrolled by suturing, compression at fracture sites, or packing inside the nasal cavity or at the wound and progressed to shock were chosen for this study. The records of treatment and complications of these survivors were reviewed for evaluation.

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Results

During the study period there were 3,756 facial fracture cases. 14 of these had persistent bleeding after primary intervention (suturing, nasal packing and wound compression) and progressed to shock in the emergency room. Five of these died and are excluded from the present study. Among the 9 survivors, there were 3 cases of LeFort fracture, 2 cases of nasal fracture, 1 case of mandibular fracture and 3 cases of multiple facial fractures. Causes of injury were 5 from physical assault and 4 from motor vehicle accident (Table 1). Repacking of the nasal cavity was performed in two cases (patient no. 5 and 9). Three cases required surgery, and three cases received angiography and embolization. One case had persistent bleeding after surgery and required

Table 1. Management of life threatening hemorrhage from facial fracture

Patient (No.)	Sex	Age (yr)	Cause	Fracture	Stop bleeding			Complication
					External	ORIF	Angiography & Embolization	
1	F	18	PA	Nasal	✓		✓	
2	M	15	TA	LeFort Mandibular	✓	✓		Blindness
3	M	45	PA	LeFort	✓	✓		Necrosis of columella
4	M	40	TA	LeFort Mandibular	✓	✓		
5	M	40	TA	LeFort	✓			
6	M	47	PA	Mandibular	✓	✓	✓	
7	M	29	PA	Nasal Zygomatic	✓		✓	
8	M	24	PA	LeFort	✓		✓	Injury of left globe
9	M	18	TA	Nasal	✓			

F = Female, M = Male, PA = Physical assaulted, TA = Traffic accident
Stop bleeding: External = suturing, nasal packing or wound compression

angiography and embolization in order to stop the hemorrhage (patient no. 6).

There were three cases with complications; one with severe injury of the eye globe requiring enucleation; one with blindness (loss of vision) due to optic nerve and orbital injury and one with nasal columella necrosis resulting from technical error from a posterior nasal packing procedure.

Discussion

Bleeding due to facial fracture can usually be controlled in the emergency room. Primary management to stop bleeding includes suturing the wound, compression on the wound or fracture site and/or nasal packing. Problems arose when all of the above interventions were performed and bleeding still persisted. In some cases, bleeding continued even after surgical intervention. Some of these cases were referred to Siriraj Hospital Trauma Center from other hospitals for further evaluation and treatment. In total, 14 cases arrived alive to be triaged. Four cases had severe head injuries and one case had multiple injuries with coagulopathy. These five patients died and were excluded from the present study. Dealing with this type of refractory bleeding, coagulation function and the probability that adequate primary management to stop bleeding should be evaluated first. This was suggested by the finding in 2 patients that blood loss was controlled by repacking of the nasal cavity. Persistent bleeding was controlled by surgical intervention[5-7] (rigid fixation of fracture sites) in 3 cases. Advances in Interventional Radiology have resulted in the use of angiography and embolization to control bleeding. The result is better than ligation of the major vessel (maxillary artery or external carotid artery)[8]. In the present study, this procedure was used in 4 cases (3 cases of angiography and embolizaion, and one case of angiography and embolization combining with surgery.) Angiography and embolization was most successful in cases of severe bleeding that were difficult to be controlled by surgery[9-11], especially in the nasal cavity (patient no.1) or in cases with deep lacerations (patient no. 7 and 8) or in severe compound comminuted fracture (patient no.6) (Fig. 1A, 1B). To review, complications were found in these three cases. One patient sustained injury to the orbital globe requiring emergent enucleation. One patient with total loss of vision, received a tracheostomy and compression bandages to the head and face in addition to anterior and posterior nasal packing (Fig. 2). He was referred to our center after receiving seven units of blood and presented with severe exophthalmos, with subsequent shrinkage of the orbital globes after swelling subsided (Fig. 3). It is not known if this complication was the result of the initial trauma or from the nasal packing procedure itself[12,13]. The last complication was necrosis of the nasal columella, caused by pressure from two foley catheters tied over it during posterior nasal packing. This procedure had been performed in the other hospital where the patient was subsequently referred to Siriraj Hospital. The foley catheters were removed immediately upon arrival but the necrosis had not been arrested. This patient also developed necrosis of the soft palate (Fig. 4).

Conclusion

Severe bleeding from facial fracture is uncommon. Primary management of persistent bleeding includes suturing, pressure and/or packing. The

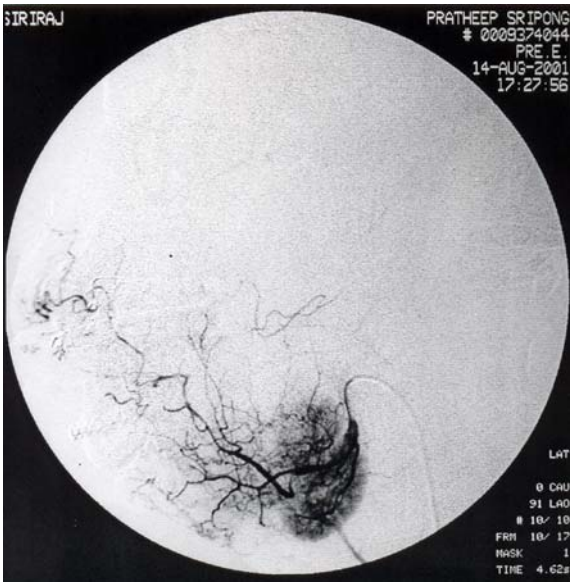

Fig. 1A Lateral digital subtraction carotid angiogram of Patient no. 6. Bleeding from right facial and lingual arteries

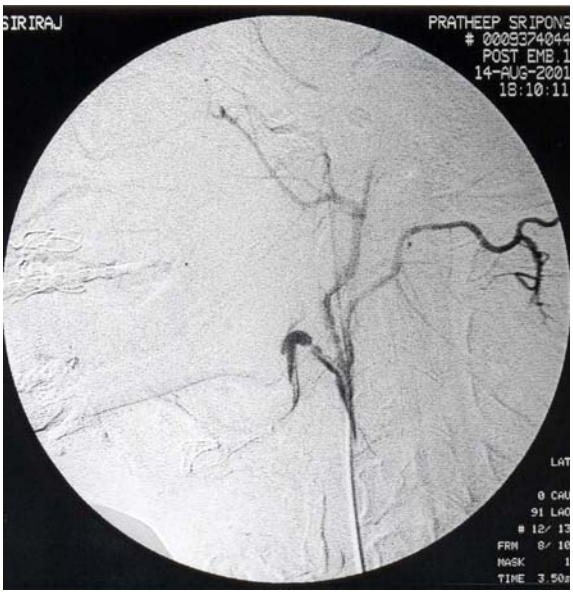

Fig. 1B Lateral digital subtraction carotid angiogram of Patient no. 6. Embolization of right facial and lingual arteries performed. No bleeding was seen

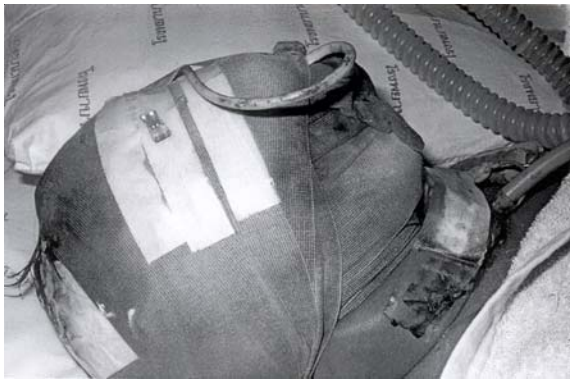

Fig. 2 Patient no. 2 with nasal packing, bandaging and tracheostomy

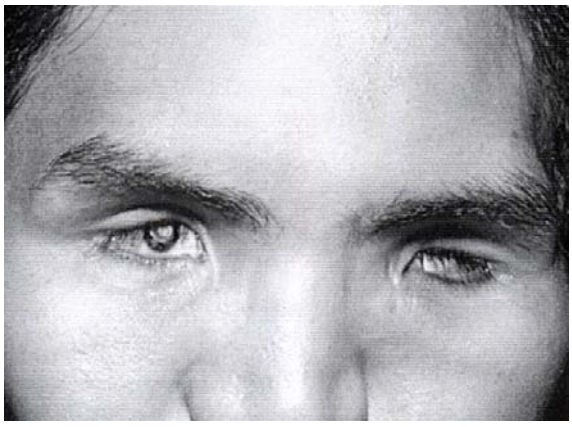

Fig. 3 Patient no. 2 after the swelling subside, he had the shrinkage of eye balls and vision loss

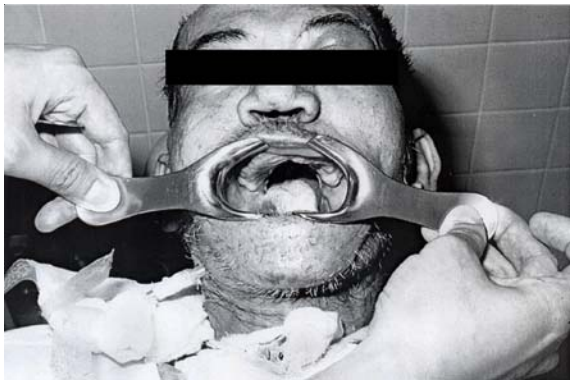

Fig. 4 Patient no. 3 with necrosis of columella and soft palate

appropriateness of these primary interventions, along with coagulation function should be considered first. If the primary interventions appear inadequate or the patient has developed a coagulopathy, the situation must be corrected. If bleeding continues, the patient will require an emergent surgical intervention to stabilize the fracture and arrest the bleeding. If surgical intervention does not control bleeding, or the site of the fracture cannot be approached by the surgeon, angiography and embolization may prove effective in controlling refractory bleeding. Careful clinical assessment and judicious selection of inter-

vention may help to prevent complications that can arise during these rare cases of life-threatening hemorrhage.

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การรักษาผู้ป่วยที่เลือดออกมากจนอาจทำให้เสียชีวิตจากกระดูกใบหน้าหัก

ปรีชา ศิริทองถาวร

ได้ทำการศึกษาหาแนวทางการรักษาผู้ป่วยกระดูกหน้าหัก ที่มีเลือดออกรุนแรงจนอาจทำให้เสียชีวิต ไม่สามารถห้ามเลือดได้ด้วยการประจุจมูก การเย็บหรือกดบริเวณนั้น โดยศึกษาจากผู้ป่วยที่รอดชีวิตหลังรับการรักษาจากผู้ป่วยกระดูกหน้าหัก 3,756 ราย ที่มารับการรักษาที่ตึกอุบัติเหตุ โรงพยาบาลศิริราช ตั้งแต่ 1 ม.ค. 2536 ถึง 31 ธ.ค. 2545 มีผู้ป่วยดังกล่าว 14 ราย รอดชีวิต 9 ราย เป็นผู้ป่วยกรามบนหัก 3 ราย, กระดูกจมูกหัก 2 ราย, กรามล่างหัก 1 ราย และกระดูกหักหลายชิ้น 3 ราย ผู้ป่วยได้รับการประจุจมูกใหม่เนื่องจากเดิมทำไว้ไม่แน่นพอ 2 ราย, ได้รับการผ่าตัดทันที 3 ราย ได้รับการฉีดสารทึบแสงหลอดเลือดแดง และฉีดสารอุดหลอดเลือดเพื่อห้ามเลือด 3 ราย ผู้ป่วย 1 ราย ได้รับการผ่าตัดแล้วเลือดยังไม่หยุด ต้องรับการฉีดสารทึบแสงหลอดเลือด และห้ามเลือด จึงจะห้ามเลือดได้สมบูรณ์ จากการศึกษานี้พอจะเป็นแนวทางในการปฏิบัติว่า การรักษาเริ่มด้วยการตรวจวิธีการห้ามเลือดที่ทำในระยะแรก เช่น การประจุจมูกว่าทำได้ดีหรือไม่ หากไม่พอเพียงก็แก้ไข ถัดจากนั้นมาหากเลือดไม่หยุดก็ทำการผ่าตัดเร่งด่วน การฉีดสารทึบแสงเข้าหลอดเลือดแดง และฉีดสารอุดเพื่อห้ามเลือด สามารถห้ามเลือดที่ออกจากบริเวณใบหน้าได้ดีเช่นกัน