Hyena Attack of a Child's Head and Face: Plastic Reconstructive Surgery Challenge

Ido Lavee MD[1], Rojjer Najjar MD[1], Patrick Ben-Meir MD[1], Eyal Sela MD[2], Yanir Kassif MD[3], Omri Emodi MD[4] and Leonid Kogan MD PhD[1]

Departments of [1]Plastic Surgery, [2]Otolaryngology, [3]Ophthalmology, and [4]Maxillofacial Surgery, Galilee Medical Center, Nahariya, Israel

KEY WORDS: reconstructive surgery, head and face, hyena, skin graft, bone graft

IMAJ 2017; 19: 123–124

The spotted hyena (*Crocuta crocuta*) is the most common carnivore in Sub-Saharan Africa, with substantial numbers found particularly in eastern regions of the continent [1]. Hyenas are large predators (45–80 kg), distinguished by exceptionally enlarged premolars, robust skulls, and heavily muscled jaws [2]. Though historically regarded as pure scavengers, hyenas are in fact effective hunters; observation studies have shown that active hunting accounts for 60–90% of their food intake [3]. A literature search yielded only a few reports of hyenas attacking humans in eastern and southern African countries over the last two centuries. Attacks on humans by spotted hyenas are likely to be underreported; however, there are increasing reports of animal attacks on humans in certain areas of Africa. An anecdotal news report (World Wide Fund for Nature 2004) indicates that there were 52 hyena attacks resulting in 35 deaths during a 12 month period in Mozambique. In Israel we are mostly exposed to treating injuries of attacks by domestic animals.

We present here the case of a severe and complex injury of the face and scalp of a young Ethiopian boy who was referred to our department following a hyena attack. His treatment required a multidisciplinary approach of plastic surgery, otolaryngology, maxillofacial and ophthalmology departments.

PATIENT DESCRIPTION

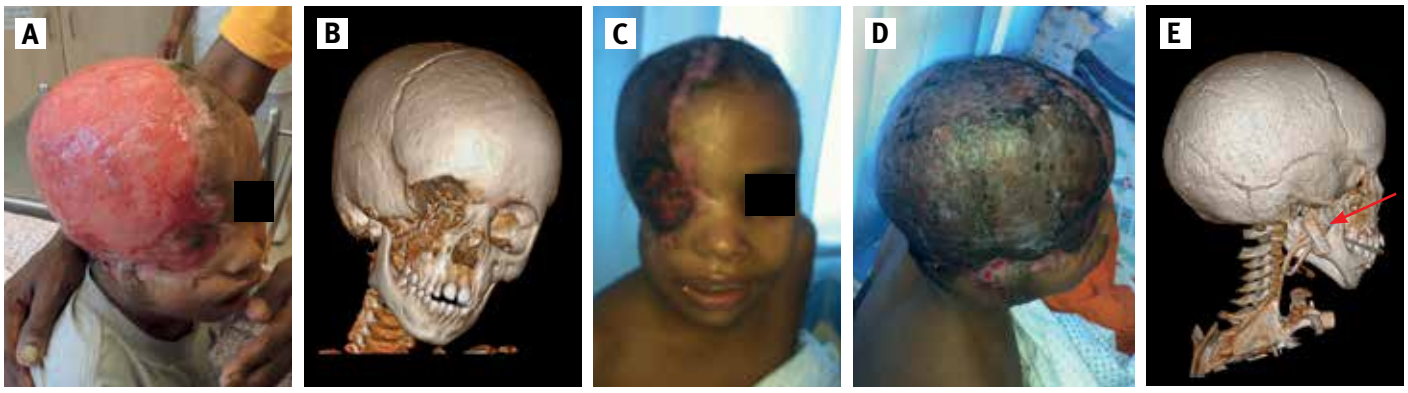
This 7 year old child barely survived a hyena attack. His face and head were severely mutilated and he was hospitalized at the Addis Ababa Medical Center, Ethiopia, for several months.

As a unique humanitarian act, this child was transferred to the Plastic Surgery Department at Galilee Medical Center in Israel, with the aid of the Israeli embassy, a Jewish organization in the United States, a local Ethiopian church and an Ethiopian Muslim organization. Upon arrival the patient was stable; his blood test showed hemoglobin 7.9 and white blood cells 12.2. Physical examination demonstrated complete amputation of the right auricle, severe damage of the right ocular globe and a vast granulated wound of the scalp [Figure 1A].

Computed tomography revealed destruction of the right temporomandibular joint with a missing bone of the right mandibular ramus [Figure 1B]. During his hospitalization the patient was isolated and treated because of VRE- and MRSA-positive cultures. Although almost 6 months had passed since his injury, we decided to immunize for rabies and tetanus due to the long incubation period. His Mantoux test was negative.

During the primary surgery, the scalp wound was irrigated, debrided and grafted [Figure 1 C and D]. Debridement and

Figure 1. [A] On arrival to the department. **[B]** First CT scan. **[C,D]** After skin grafting of the face. **[E]** Bone graft



grafting of the external acoustic canal (ear drum sparing) were also performed. Unfortunately, evisceration of the right eye was necessary due to the severe damage. Two weeks later the patient underwent mandibular reconstruction with rib bone grafting [Figure 1E].

Upon the child's release home, the scalp and right eye wounds were completely healed, and good articulation was established in the right temporomandibular joint with normal mouth opening. Follow-up was conducted by our maxillofacial surgeon during another humanitarian mission several months later in Addis Ababa.

COMMENT

Attacks on unsuspecting humans usually occur in open, rural areas when the "prey" is away from the protection of the group [3]. Attacks that occur despite the presence of the group may suggest that the animal does not fear humans and considers them a potential source of food [3].

Hyenas do not randomly select prey; they search and wait until they find a weakened prey based on appearance and behavior. The hyena pattern of attack is primarily to the face, causing extensive soft tissue loss with facial bones crush between the jaws [4]. Usually the soft tissue injuries are treated by removing or releasing the scar tissue and promoting granulation tissue to gain tissue coverage.

Split-skin grafts for the scalp, a flap for lip defects based on the size of the wound, a forehead flap for nasal reconstruction, and rib grafts to repair mandibular defects are used. Treatment has to be individualized for each case based on the particular deformities, and using a multidisciplinary approach. Special attention is given to combatting infection including treatment with broad-spectrum antibiotics and active and passive immunization for rabies and tetanus [5].

Although such injuries are unusual for Israel, since there are no hyenas or "big cats" (lions, tigers, leopards, etc.) in the country, the patient was treated successfully and both the functional and cosmetic outcome was acceptable.

Correspondence
Dr. I. Lavee
Dept. of Plastic Surgery, Galilee Medical Center, P.O. Box 21, Nahariya 22100, Israel
Fax: (972-4) 910-7454
email: Idol@gmc.gov.il

References

1. Abay GY, Bauer H, Gebrihiwot K, Deckers J. Peri-urban spotted hyena (Crocuta cro- *cuta)* in northern Ethiopia: diet, economic impact, and abundance. *Eur J Wildl Res* 2011; 57: 759-65.
2. Hayward MW. Prey preferences of the spotted hyena (Crocuta crocuta) and the degree of dietary overlap with the lion (Panther leo). *J Zool* 2006; 270: 606-14.
3. Cooper SM, Holekamp KE, Smale L. A seasonal feast: long-term analysis of feeding behaviour in the spotted hyaena (Crocuta crocuta). *Afr J Ecol* 1999; 37: 149-60.
4. Fell MJ, Ayalew Y, McClenaghan FC, McGurk M. Facial injuries following hyena attack in rural eastern Ethiopia. *Int J Oral Maxillofac Surg* 2014; 43: 1459-64.
5. Goldstein RW, Goodhart GL, Moore JE. Pasteurella multocida infection after animal bites. *N Engl J Med* 1986; 315: 460.