Unusual Cheek and Upper Extremity Pressure Ulcers Resulting from Head-on-Hand and Arm Napping

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Abstract: Pressure ulcers commonly occur on the sacrum, ischium, lateral trochanter, and heel where pressure or shearing forces continuously affect bony prominences. The following describes three cases of unusual pressure ulcers of the cheek and upper extremity. Patients developed the wounds as a result of lying face downward on the hand for a prolonged period. All facial wounds were treated conservatively and eventually healed, but the damage to the hands was irreversible due to severe complications related to muscle contraction. The authors suggest that the risk factors for these unusual ulcers are living alone, and the combination of sleep aid medication and alcohol consumption.

Three cases of unusual pressure ulcers that occurred on the cheek and upper extremity simultaneously are reported. Risk factors for these ulcers are proposed.

Case Reports

Case 1: An 89-year-old man who lived alone and was found by his family lying prone on a table after a fall. The man had been lying face downward on his hand for approximately 2 days. He did not have any illicit drugs in his system. He was brought to our emergency unit immediately. On arrival, the patient was conscious without any signs of neurological deficits. He was diagnosed with acute renal failure most likely due to severe long-term dehydration; thus, he underwent emergent hemodialysis. The initial examination revealed a deep pressure ulcer to the left cheek and left hand, which were both classified as Stage IV according to the National Pressure Ulcer Advisory Panel's staging system (Figures 1A and 1B). Necrotic tissue was removed from both wounds. Wound management was performed conservatively with ointment-impregnated gauze (Ekizalbe®). The wounds began to heal and abundant granulation tissue had developed on the wound surface 2 weeks later; however, the left little finger became necrotic due to ischemia (Figures 1C and 1D). The patient subsequently was moved to another hospital because his renal failure as well as overall condition improved.
Case 2: A 75-year-old man, who was living alone, was discovered by his panic-stricken daughter who had not had contact with him for 2 days. She found the patient lying prone on a table after a fall. He had been lying face downward on his hand. He had liver dysfunction due to alcoholism. Sleep aid medication and alcohol were presumed to be involved in his unconscious state. At first, the patient was taken to another hospital where he underwent treatment for acute renal failure. However, the renal dysfunction worsened and progressed to nephrotic syndrome, while the pressure ulcer of the left hand progressed. Thus, the patient was moved to the authors’ unit 50 days post injury.

Initial examination revealed a deep pressure ulcer measuring 2.5 cm × 2 cm on the left thenar, which reached the thenar muscles (Figure 2A). He had also sustained a pressure ulcer measuring 1.5 cm × 1 cm to the left cheek, which was thought to be Stage IV, but had already epithelized (Figure 2B). Necrotic tissue of the hand pressure ulcer was removed and wound management was performed conservatively, while a splint to prevent palmar contracture was employed. Abundant granulation tissue developed on the wound surface 40 days later; however, severe hand contraction persisted (Figure 2C). The patient then transferred to another hospital since the renal disorder, and his overall condition, had improved.

Case 3: A 41-year-old man, who lived alone, had slept for approximately 1.5 days after taking sleeping medication and consuming alcohol. He was experiencing severe left forearm and left cheek pain due to pressure ulcers that were present upon waking.

Initial examination revealed a deep pressure ulcer to the left forearm. Left radial, ulnar, and median nerve palsy were also observed (Figures 3A and 3B). Due to the deep
Figure 2A. The patient had sustained a deep pressure ulcer to the left thenar, which reached the thenar muscles.

Figure 2B. He had also sustained a pressure ulcer to the left cheek, which was thought to be Stage IV, but had already epithelialized.

Figure 2C. Severe left hand contraction remained 40 days later.

Figures 3A and 3B. The patient had sustained a deep pressure ulcer to the left forearm.

Figure 3C. The patient had also sustained a Stage II pressure ulcer to the left cheek.

Figure 3D. Wounds on the forearm healed 25 days after injury; however, severe hand contraction remained as a result of ischemic contracture of the deep flexor muscles.

Figure 3E. The ulcer on the cheek was conservatively treated and healed within 20 days, but depressive scar deformity and pigmentation remained.
muscle injuries, the level of serous creatinine phosphokinase (CPK) rose markedly (14,793 IU/L), which suggested the development of compartment syndrome. Thus, an emergent decompression incision to the forearm fascia was performed. The patient also developed a Stage II pressure ulcer on the left cheek measuring 2.5 cm × 2 cm (Figure 3C). Ten days after admission the patient underwent free skin grafting to resurface the decompression incision wound, as the swelling of the forearm had reduced. Wounds on the forearm healed without a raw surface 25 days after injury; however, severe hand contraction remained due to ischemic contracture of the deep flexor muscles (Figure 3D). The cheek ulcer was conservatively treated with ointment-impregnated gauze and healed within 20 days, but depressive scar deformity and pigmentation remained (Figure 3E).

Discussion

Pressure ulcers develop due to direct pressure or shearing forces acting on local soft tissue. Pressure ulcers commonly occur on the sacrum, ischium, lateral trochanter, and heel, or where forces continuously place pressure over bony prominences. The cheek, which contains the prominent zygomatic bone, may be a predictable site for pressure ulcer development. However, facial pressure ulcers are rare, because the necessary level of force and duration of pressure to the face are less likely compared to the buttocks and legs.

Sugama et al reported 711 patients with pressure ulcers in 2008, and reported that 7 patients developed pressure ulcers of the auricle 1 in the temporal area, and 4 of the elbow. None of the patients developed pressure ulcers of the forearm, hand, or face. Previous reports have described facial pressure ulcers in unusual circumstances. Facial pressure ulcers have been reported as iatrogenic incidents. Patients using a facemask for nasal intermittent positive pressure ventilation sometimes develop nasal bridge pressure ulcers. Fujioka et al reported pressure ulcers of the upper lip that developed in 5 very low birth weight infants subsequent to unsuitable endotracheal tube fixation. Gross et al reported a pressure ulcer of the chin following genioplasty due to excessive pressure created by a hard dressing. Other than these iatrogenic incidents, Taylor et al reported a case of a submental pressure ulcer secondary to severe senile kyphosis.

Pressure ulcers developing on the hand remain rare and seldom are reported in the literature since the hand and forearm are not under continuous pressure in daily life. Nevertheless, it is known that once the intrinsic muscles and flexor digitorum muscles develop sustained ischemia for more than 6 hours that irreversible muscle degeneration occurs, which leads to severe hand dysfunction. The patients in the present cases all had severe functional disorders including contraction of the fingers and finger loss, which could not be restored as the muscles had degenerated.

The mechanism of cheek and hand pressure ulcer development at the same time is simple and clear—when a patient lies face downward on the hand, the cheek and hand press against each other and consequently, these rare ulcers develop. A longer period of pressure is necessary for these unique pressure ulcers to develop compared to common pressure ulcers; this is because both the face and hands have thick, well-vascularized soft tissue. In the authors’ experience, 2 days of continuous head on hand or head on arm pressure is sufficient to develop a pressure ulcer. Two days of continuous such pressure may result from several causes that include trauma, stroke, hypoglycemia, sleep aid medication, and alcohol consumption. Some of these incidents are fatal. The patients presented in Case 1 and Case 2 experienced acute renal failure as a result of severe dehydration. Either patient might have died if his family had discovered him later. In light of this, it is proposed that the most important risk factor for head on hand or head on arm pressure ulcers is living alone. In the presented cases, the reasons for the 2 days of continuous lying are unknown because first examinations of all patients revealed did not reveal neurological or cardiopulmonary disorder. Transit cerebral infarctions, arrhythmia attack, coronary artery spasm, and epilepsy may induce a loss of consciousness without after effects. Past history of these diseases is another risk factor of developing this type of pressure ulcer. The patients in Case 2 and Case 3 slept deeply after taking sleep aid medication and consuming alcohol, which are also risk factors.

Conclusion

All facial wounds were healed conservatively. Damage to the hands remains a significant complication due to muscle contraction. The risk factors for these undesirable pressure ulcers are thought to be living alone, and the combination of sleep aid medication and alcohol consumption.

References

1. National Pressure Ulcer Advisory Panel. Pressure ulcer stages revised by NPUAP. Available at:


