
Long-Term Follow-Up of Patients Treated for Toxic Epidermal Necrolysis

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Patient outcomes concerning toxic epidermal necrolysis (TEN) have improved over the years as a better understanding of the pathophysiology of the illness has been gained and enhancements have been made in the care of the acutely ill. With increase in survival, long-term complications these patients experience are beginning to be recognized. In this study, we analyzed the outcomes of a cohort of TEN survivors treated at our burn unit and sought to determine the impact of clinical variables from the initial hospitalization on mortality after discharge. We performed a retrospective review of data from patients with TEN treated at our burn unit from March 1993 to September 2002. Follow-up data on new health problems were collected on patients who were alive at discharge via questionnaire. Survival was estimated using the Kaplan–Meier method with Cox regression model. During the study period, of the 64 patients treated for TEN, 46 survived. After discharge, 15 patients died, whereas the remaining 31 patients continued to suffer from ocular (54%), skin (81%), and renal (23%) problems. Median survival for the whole cohort has not been reached, with an estimated 5-year survival of 65%. No patient in either group had a TEN recurrence. Seventy-nine percent of the patients with ocular involvement in the acute phase of TEN had long-term ocular complications, and 73% of patients with mucosal involvement had persistent mucosal lesions. Five individual factors were found to be predictors of post-discharge mortality on univariate analysis: age at diagnosis of TEN \geq 60 years, SCORTEN 3 to 6, % maximal TBSA slough \geq 50%, days from onset of symptoms to admission to a burn unit \geq 5 days, and presence of multiple comorbidities at diagnosis of TEN. In multivariate analysis, only SCORTEN of 3 to 6 ($P = .003$) and days to admission \geq 5 ($P = .027$) maintained significance as predictors of mortality and may be used to heighten surveillance during postdischarge care of patients with TEN. (*J Burn Care Res* 2006;27:26–33)

Toxic epidermal necrolysis (TEN) is a rare and severe exfoliative skin disorder most commonly associated with the administration of medication. The pathogenesis of TEN is not well understood but may involve an immunologic mechanism in which keratinocyte apoptosis occurs in the epidermis, leading to derma–epidermal separation, resulting in large areas of skin and mucosal surface exfoliation, further lead-

ing to large cutaneous and visceral wounds requiring meticulous care and multiorgan support in a burn unit.¹ Viard et al² showed keratinocytes from patients with TEN express the lytically active Fas ligand, which mediates apoptotic cell death by interacting with Fas. They also found that intravenous immunoglobulins containing anti-Fas antibodies inhibited Fas induced apoptosis in vitro, thus further supporting the immunologic mechanism behind TEN.² Several case reports describe successful treatment of TEN with intravenous immunoglobulin³; however, recent studies do not show a significant improvement in mortality for patients with TEN who are treated with immunoglobulin.^{4–6}

After the onset of TEN symptoms, early transport to a burn center has been shown to improve patient outcome in the acute phase.⁷ Studies also showed that factors such as advanced age, thrombocytopenia, and premorbid medical problems,⁸ as well as sepsis

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and extent of TBSA involvement⁹ and a high Severity of Illness Score for Toxic Epidermal Necrolysis (SCORTEN) score¹⁰ were significant in predicting mortality of the acute illness. SCORTEN is a TEN-specific severity of illness score based on a set of seven independent variables that were found to be significant risk factors for in-hospital death during the acute phase of TEN.¹⁰

Acute complications of TEN include respiratory failure, gastrointestinal hemorrhage, renal tubular necrosis, and sepsis, which was found to be the most frequent cause of death.^{11,12} During the acute phase, mortality ranges between 30% and 60%. Over the years, patient outcome has improved with a better understanding of the pathophysiology of the process and enhancements in the care of the critically ill, with subsequent increase in survival rates. With the increase in survival, the long-term complications these patients experience are beginning to be recognized.

There are three studies published that address the long-term complications of TEN survivors. Sheridan et al¹³ studied the complications of TEN in eleven pediatric patients, Magina et al¹⁴ concentrated on examining specific dermatological and ophthalmological sequels in eight patients with TEN, and Haber et al¹⁵ reported late outcomes of 13 adult TEN survivors initially treated at a burn center. Thus far, the impact of clinical variables from the acute hospitalization of patients with TEN on long-term survival has not been studied.

The purpose of the current study was to examine a cohort of TEN survivors treated at our burn center during a 9-year period. In addition to determining the specific long-term complications that the patients with TEN had years after the acute illness, we also looked at significant clinical variables during the initial hospitalization that were predictors of the long-term outcomes. We then determined the degree of impact these variables had on survival and how well they determined the risk of death after discharge after the acute phase of TEN. We hope to use this information to tailor postdischarge follow-up in an effort to reduce morbidity and mortality in this unique patient population.

METHODS

After seeking approval by the Loyola Institutional Review Board, we undertook a retrospective review of data from patients with TEN who were treated Loyola University Chicago's Burn Center from March 1993 to September 2002. Patients with TEN were identified by searching the burn unit admission records and the pathology record database. The ini-

tial diagnosis of TEN was made by full-thickness skin punch biopsy or, in absence of biopsy, TEN was diagnosed by documentation of greater than 30% TBSA epidermal detachment, or with less than 30% TBSA epidermolysis and epidermal detachment of one or more mucosal surfaces (ocular, respiratory, gastrointestinal, or urogenital).

Chart Review

Inpatient data on acute outcomes of TEN was collected from patient charts. Patients that died during the acute phase were excluded from the study, whereas patients surviving to discharge made up the cohort. Inpatient data collected about the survivors included age at diagnosis, gender, length of stay, maximum percent TBSA epidermal detachment, mucosal and ocular involvement, days from onset of symptoms to admission to the burn unit, complications during the acute phase, and comorbidities. The comorbidities that were encountered included presence of malignancy, liver cirrhosis, renal failure, congestive heart failure, diabetes, systemic lupus erythematosus, rheumatoid arthritis, hypertension, seizure disorder, chronic obstructive pulmonary disease, asthma, history of cerebrovascular accident, and HIV/AIDS.

A calculated SCORTEN was also given for each patient, with one point given for age greater than 40 years, heart rate on admission greater than 120 beats/min, initial TBSA epidermal detachment greater than 10%, history of malignancy, BUN greater than 28 mg/dl, HCO₃ less than 20 mg/dl, and glucose greater than 252 mg/dl.¹⁰ Length of stay was defined as the duration of hospitalization during the acute phase. Days from onset of symptoms, including a skin rash and constitutional symptoms, until transfer to a burn unit was obtained. Complications were defined as unforeseen events that occurred during the hospital stay, and were identified from reviewing daily progress notes. Complications included organ system failure, infections, deep venous thrombosis, pulmonary embolism, pancreatitis, seizures, atrial fibrillation, pneumothorax, cerebrovascular accident, pancytopenia, mental status changes, ileus, and free air requiring laparotomy.

Follow-up Data

Follow-up information regarding TEN recurrences, new health conditions, medical diagnoses, hospitalizations, surgeries, and new medications was collected from acute phase survivors via a letter and questionnaire sent to the last known address of the patient. The questionnaire explicitly stated questions about: the current status of the patient (alive or de-

ceased), any recurrence of TEN, new medical conditions, diagnoses, hospital admissions, surgeries, and new medications since discharge from the hospital after TEN. If the patient was deceased a cause of death was sought. A follow-up telephone interview was conducted, for those patients giving consent, to clarify the responses provided. For patients deceased at the time of study, the Social Security Death Index was searched to confirm the deceased status, and the cause of death was obtained via contact of the next of kin, or autopsy reports, if available.

Statistical Analysis

Statistical analyses were performed using SPSS for Windows, version 10.0 (SPSS Inc, Chicago, IL). Descriptive statistics were reported as proportions. Continuous variables were reported as mean \pm SD. Categorical variables were compared using Fisher's exact probability test, and continuous variables were analyzed using a two-tailed Student's *t* test. A two-tailed $P < .05$ was considered statistically significant. Univariate and multivariate forward stepwise logistic regression analysis was used to analyze prognostic value of each significant clinical variable in relation to post-discharge mortality. Multivariate analysis was performed using Cox proportional hazards model. Mortality predictors were considered to have statistically significant effect if the 95% confidence interval did not include the value 1. Survival was estimated using the Kaplan–Meier method, and survival curves were compared using the log-rank test.

RESULTS

Between March 1993 and September 2002, a total of 64 patients were treated at our burn center for TEN. Of the 64 patients, 18 (28%) died during the acute

phase of TEN, and 46 (72%) survived to discharge. The 46 survivors made up the cohort for the study and had a mean follow up of 55 ± 41 months. On follow-up, it was found that 15/46 (33%) patients died within a discharge time of 12 ± 16 months, and 31/46 (67%) were alive at the time of the study, with survival of 76 ± 32 months. Demographic characteristics of the TEN patients are presented in Table 1. Of the 46 patients, 30 (65%) were women, with a mean age of 52 ± 26 years for the entire cohort. The delay in admission to the burn unit from the onset of symptoms was 6.4 ± 5.7 days, with a length of stay of 16 ± 11 days during the initial hospitalization. The percent of maximum TBSA epidermal detachment was 47 ± 23 %. Patients with TEN had an average of 1.28 ± 1.12 comorbidities present at the time of diagnosis. The calculated severity of illness index, SCORTEN, for the cohort was 2.0 ± 1.3 , and the average number of complications experienced by individual patients was 1.8 ± 1.8 . Mucosal surface damage was observed in 35/43 (81%) patients, the most common being oral mucosa, followed by tracheal, genital, and anal mucosa. Ocular involvement of TEN was seen in 34/43 (79%) patients during the acute phase, an ophthalmologist evaluated all patients with TEN on admission and as needed throughout their stay.

There was no significant difference between the patients alive and deceased after discharge in terms of gender, percent maximum TBSA slough, length of stay, number of complications, and presence of mucosal or oral involvement during the acute phase of TEN (Table 1). Four demographic variables were statistically different ($P < .05$) between the patients who died since discharge and those alive at the time of follow-up. The patients that died since discharge were significantly older (68 ± 16 years) than the alive group (40 ± 25 years) ($P < .001$). There was a

Table 1. Demographic characteristics of patients with toxic epidermal necrolysis

Variable	All Patients (N = 46)	Alive (N = 31)	Deceased (N = 15)	P Value
Age at Dx, years	52 ± 26	40 ± 25	68 ± 16	<.001
Gender, M:F	16:30	11:20	5:10	.943
Days to admission	6.4 ± 5.7	5.1 ± 5.9	8.9 ± 4.4	.039
% Max TBSA slough	47 ± 23	44 ± 24	56 ± 19	.134
No. of comorbidities	1.28 ± 1.12	1.0 ± 1.1	1.9 ± 1.0	.016
Length of stay, days	16 ± 11	15 ± 6	19 ± 15	.371
SCORTEN	2.0 ± 1.3	1.6 ± 1.1	3.2 ± 1.2	<.001
No. of complications	1.8 ± 1.8	1.6 ± 1.4	2.1 ± 2.5	.485
Mucosal involvement (%)	35/43 (81)	21/28 (75)	14/15 (93)	.226
Ocular involvement (%)	34/43 (79)	21/28 (75)	13/15 (87)	.458

Two-tailed Student's *t* test.

greater delay in admission to the burn unit among the deceased patients (8.9 ± 4.4 days) vs the alive group (5.1 ± 5.9 days; $P = .039$). The deceased patients had a greater number of comorbidities present with, on average, 1.9 ± 1.0 comorbidities at the time of diagnosis of TEN, with the alive patients having 1.0 ± 1.1 comorbidities ($P = .016$). The calculated SCORTEN, which measured the severity of the TEN illnesses, was significantly higher among the deceased, 3.2 ± 1.2 , than the alive group 1.6 ± 1.1 ($P < .001$).

Prognostic Factors

Table 2 shows the predictors of survival in TEN patients that were considered, along with their relation to postdischarge mortality. The total number of patients included in the calculations of each of the variables was considered, and if the data were not explicitly stated in the chart during review, the patient was excluded from this analysis. On univariate logistic regression analysis, factors that were significant predictors of mortality after the acute phase of TEN were age 60 years or older, a high SCORTEN (between 3–6), delay in admission to the burn center from the onset of symptoms of 5 days or longer, % of maximum TBSA slough 50% or greater, and the presence of more than one comorbidity. The number of these individual clinical factors present in the patients with TEN was correlated with the overall 24-month postdischarge survival (Figure 1). The 24-month survival

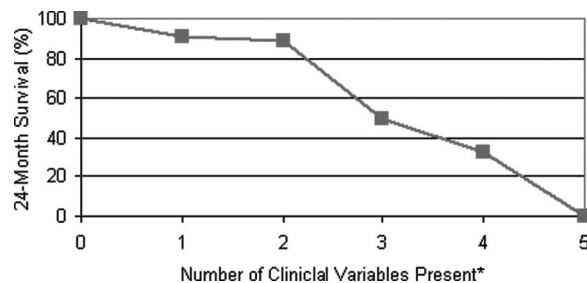


Figure 1. Twenty-four month survival based on number of prognostic clinical variables present. *Clinical variables: age 60 years or older, SCORTEN 3 to 6, % max TBSA slough 50% or greater, days to admission 5 days or greater, more than one comorbidity.

for six patients who did not have any of the prognostic clinical variables present was 100%, and with increasing number of these variables present, the survival decreased to 91%, 89%, 50%, 33%, for the presence of one, two, three, and four of the mortality factors, respectively. There were five patients who had all five of the mortality factors present with a corresponding postdischarge mortality of 100%.

The results of multivariate logistic regression analysis revealed two independent predictors of postdischarge mortality (Table 2): a high SCORTEN ($P = .003$; 95% confidence interval 2.17–51.3), and a 5-day or greater delay in admission to the burn center from the onset of symptoms

Table 2. Predictors of postdischarge mortality of patients with TEN.

Variable	Alive (n = 31)	Deceased (n = 15)	P Value (Univariate)	P Value (Multivariate)	95% Confidence Interval
Age at diagnosis					
<60 years, n (%)	24/31 (77)	6/15 (40)	.021	NS	–
≥60 years	7/31 (23)	9/15 (60)			
SCORTEN					
0-2	25/29 (86)	2/12 (17)	<.001	0.003	2.17–51.3
3-6	4/29 (14)	10/12 (83)			
Days to admission					
<5 days	19/27 (70)	4/13 (31)	.001	0.027	1.22–29.0
≥5 days	8/27 (30)	9/13 (69)			
% Max sough					
<50%	16/28 (57)	2/12 (17)	.035	NS	–
≥50%	12/28 (43)	10/12 (83)			
No. of comorbidities					
>1	21/27 (78)	4/12 (33)	.012	NS	–
>1	6/27 (22)	8/12 (67)			

Five variables were significant predictors of mortality on univariate analysis. SCORTEN (0–2 vs 3–6) and days to admission from the onset of symptoms (<5 vs ≥5) were significant on multivariate analysis as significant independent predictors of postdischarge mortality.

($P = .027$; 95% confidence interval 1.22–9.0). Figure 2 shows the Kaplan–Meier survival curve for the two variables that maintained significance as independent predictors of mortality after discharge. Patients with a SCORTEN of 3 to 6 had a median survival of 7 months after discharge with a range between 1 and 71 months, and an overall predicted 48-month survival of 28%. The median survival for patients with SCORTEN of 0 to 2 has not been reached, and the patients had an overall 92% 48-month survival. Patients with a 5-day or greater delay in admission to the burn unit from the onset of symptoms had a median survival of 18 months (range, 1–112), and a 48-month survival of 42%. The median survival for patients admitted within 5 days from the onset of symptoms has not been reached, and their estimated 48-month survival was predicted as 89%.

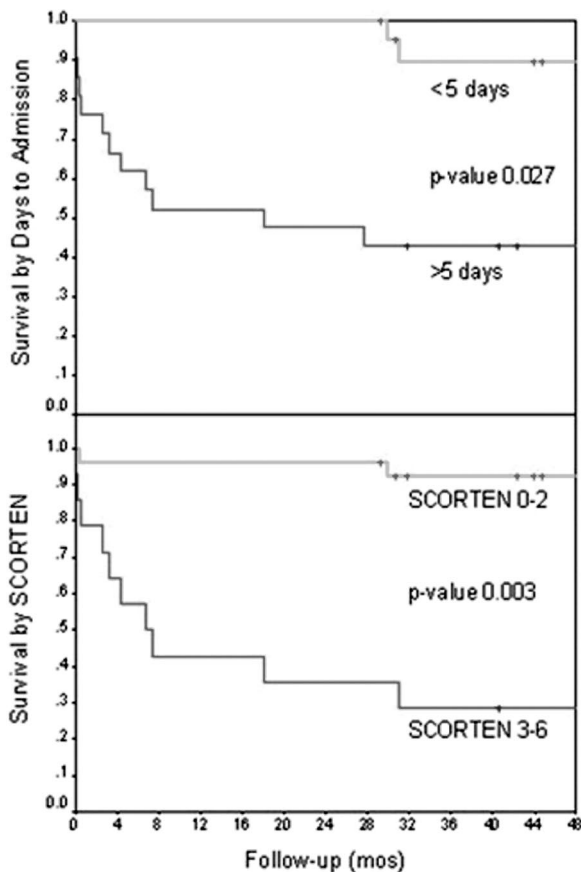


Figure 2. Kaplan–Mayer 48-month survival curve. Median survival for patients with a 5-day or greater delay in admission to the burn unit was 18 months ($P = .027$), and median survival for patients with a SCORTEN of 3 to 6 was 7 months ($P = .003$). Median survival for admission at <5 days from the onset of symptoms, and a SCORTEN of 0 to 2 has not been reached.

Long-Term Complications

A total of 46 TEN survivors were included in the follow-up, with a median follow-up of 53 months (range, 0–144). Since discharge, 15 of 46 patients (33%) died, with a median time to death of 4.0 months (range, 0–53). Follow-up was available for 10 of these patients. Cause of death was sepsis in one, renal failure in one, multiorgan system failure in two, and cardiac failure in three. The rest are unknown. Thirty-one patients (67%) were still alive at the time of this study, with a median follow-up of 74 months (range, 30–144). Median survival for the entire cohort has not been reached. Estimated 5-year survival since discharge was 65%. Follow-up data were available for 26 of the surviving patients. No patient in either group had a TEN recurrence. New medical conditions were primarily dermatological in 21 patients (81%) and ocular in 14 (54%), and long-term mucosal surface damage in 11 (44%), and renal problems in 6 (23%; Figure 3). Patients with TEN had an average number of 0.94 ± 1.73 hospitalizations after discharge, and an average number of 1.56 ± 2.86 surgeries. The most common surgeries were ophthalmological, followed by orthopedic surgeries. The most common long-term dermatologic complications involved skin depigmentation in 14 of 26 (54%) patients, scarring in 10 of 26 (38%), pruritus in 7 of 26 (27%), and nevi in 5 of 26 (19%). Eleven of 14 (79%) patients with ocular involvement of TEN during hospitalization had long-term ocular problems; no patient developed new eye problems after discharge. Among the ocular complications reported were: dry eye syndrome, photophobia, corneal neovascularization, trichiasis, lid adhesions, lacrimal duct scarring, ocular pain and discharge, and visual acuity problems. Seventy-three percent of the patients who had mucosal involvement in the acute phase of TEN developed long term mucosal complications. Among patients that reported long term mucosal sequelae, the most common site was the oral mucosa (45%) and the esophageal mucosa (45%), followed by lung mucosa (18%), and genital mucosa (9%).

DISCUSSION

We reviewed a group of 46 TEN survivors treated at our burn unit during a 9-year period. Our analysis included the long-term complications that TEN survivors had years after discharge along with a review of in-patient variables and their correlation with postdischarge outcome of these patients. We found five clinical variables on univariate analysis that correlated with postdischarge mortality: advanced age, a high

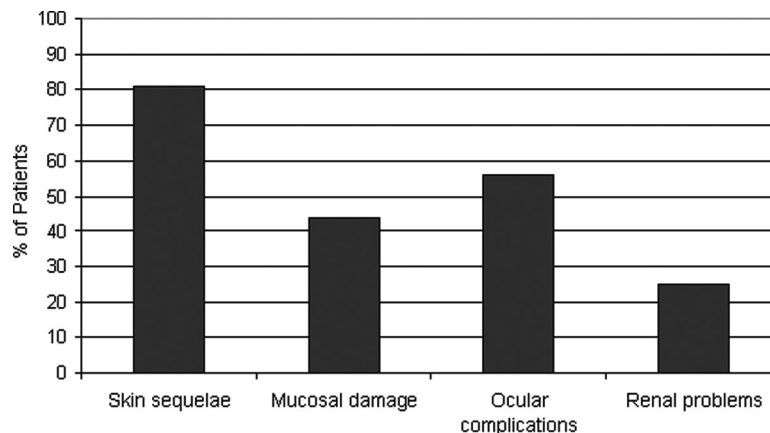


Figure 3. Distribution of common long-term complications among TEN survivors.

SCORTEN, a delay in admission to our burn unit, high maximum percent TBSA slough, and presence of multiple comorbidities at the time of diagnosis of TEN. On multivariate analysis, only SCORTEN and delay in admission to a burn unit maintained significance as independent predictors of postdischarge mortality.

The incidence of TEN among the elderly is increasing, especially as a result of the increased use of medications among this population.¹¹ Previous studies showed that advanced age is a significant predictor of mortality in the acute phase of TEN,^{8,9,16} although one institutional review of TEN in elderly patients did not find a significant correlation between age of elderly survivors versus nonsurvivors.¹⁷ Even though the effect was not statistically significant on multivariate analysis as an independent predictor of postdischarge mortality, our results indicate that advancing age has an effect on mortality after surviving the acute episode of TEN. This finding may be attributed to the fact that age is included in SCORTEN, and when these factors are considered together, age loses its significance as an independent predictor of post-discharge mortality.

Through this study, we also found that the severity of illness index, SCORTEN, was a significant independent predictor of postdischarge mortality in our patient population. Patients with a high SCORTEN of 3 to 6 had a 64% lower 48-month survival rate than patients with a lower SCORTEN of 0 to 2, indicating that this score also may be a useful prognostic indicator for long-term outcomes in TEN survivors. This observation supports our belief that patients with a high SCORTEN may require more aggressive clinical surveillance after discharge from the burn unit.

Previous studies have shown that a delay in referral to a burn unit after the onset of symptoms of TEN is

a significant risk factor for poor outcome in the acute phase of the illness.^{8,18,19} One multicenter review of patients with TEN implicated that a delay in transfer of more than 7 days after the onset of symptoms was associated with a significantly increased mortality.⁷ Kelemen et al²⁰ showed that the length of hospitalization was twice as long in patients transferred to a burn center more than 7 days after the onset of epidermal detachment, compared to patients transferred before 7 days, with similar age, and extent of epidermal involvement. Our results indicate that delay in referral to a burn center also has implications on the long-term outcome of TEN survivors. Patients with a 5-day or greater delay in admission had significantly lower postdischarge survival than those with earlier referral to a burn unit. Because early referral to a burn center capable of managing the multiple facets of TEN can potentially slow and halt the progression of the illness, prompt transfer to a burn center based on the results reported here has an effect on the long-term complications of TEN and in turn on the overall survival of the patients who are discharged from the hospital after a successful recovery from their acute episode. Because the delay in transfer is significant in predicting mortality in both the acute and long-term phase of TEN, this argues strongly for prompt diagnosis and aggressive and systematic care of patients with TEN at a burn unit, early in the onset of this illness.

Although early recognition of TEN and prompt referral to a burn center have improved the acute outcome of the illness, survivors of TEN may experience a variety of long-term complications. Similar to other institutional studies,¹²⁻¹⁵ the most common long-term sequelae encountered in our patients were dermatological and ocular. Eighty-one percent of patients in this series had long-term skin sequelae com-

pared with 69% to 100% reported in other studies.¹³⁻¹⁵ Most common skin sequelae involved changes in pigmentation, including both hyperpigmentation and hypopigmentation, along with scar formation at sites of the initial TEN involvement. Pruritus occurred in 27% of our patients, slightly less than the 33% reported by Haber et al,⁵ most commonly occurring on extensor surfaces, such as elbows and knees. Nineteen percent of our patients reported new nevi formation since discharge after TEN. This was previously described in a case report that implied that these nevi result from a benign melanocytic hyperplasia, which accompanies keratinocyte hyperplasia during the healing process of some of the denuded areas of the skin.²¹ We found that the skin changes tend to fade over time but persist for years after the acute illness.

Ocular involvement during the acute phase of TEN is very common and frequently leads to severe and disabling ocular complications that affect survivors of TEN. Acute ocular lesions involve swelling and loss of skin from the eyelids; this effect, along with conjunctival inflammation and necrosis, may lead to pseudomembranous or membranous conjunctivitis²² and loss of goblet cells.²³ Loss of goblet cells and stenosis of the lacrimal gland ductules⁹ are two factors that ultimately lead to dry eye syndrome, which was the most common long-term ocular complication reported by our patients. Chronic dry eyes commonly were managed by daily use of artificial tears, and several patients had a punctal occlusion procedure (closure of the tear duct opening).

In the acute phase of TEN ocular discomfort caused by inflammatory erosions, along with lacrimal duct scarring, can cause excessive tearing and predispose the conjunctiva to form adhesions between the eyelids (symblepharon).¹¹ These adhesions require surgical lysis,²³ especially in the early phases of recovery from TEN. Without prompt intervention, the adhesions can ultimately lead to malposition and inturning of the lid (entropion), which along with regrowth of aberrant eyelashes (trichiasis), are the second most frequent long-term ocular complications of TEN, often requiring surgical correction. With the high rate of ophthalmologic complications found in TEN survivors, ophthalmologic surgeries were the most common surgeries among our patients, with one patient in our series undergoing nine surgeries for eye complications. Ocular sequelae contribute significantly to long-term morbidity of TEN patients,¹⁴ further reemphasizing the need for early ophthalmologic consultation.

In the acute phase, mucus membrane involvement in oral, tracheal, genitourinary, and anal regions was

observed in 81% of our patients. On follow-up, 44% of patients reported persistent mucous membrane lesions, which is slightly higher than the 30% of patients reported by Revuz et al.¹² Chronic mucous membrane erosions may persist after regrowth of the epidermis and can leave atrophic scars that resemble lesions of cicatricial pemphigi or lichen planus.¹¹ In our patients we found most common long-term lesions involved the oral and esophageal mucosa. Specific complications included depapillation of the tongue, observed in two patients, while one patient reported esophageal strictures. Patients with persistent esophageal lesions reported symptoms of gastroesophageal reflux, with many taking anti-reflux medications to combat the symptoms.

Respiratory tract epithelium involvement is not uncommon in the acute phase of TEN, occurring in 27% in one study,²⁴ with overall 10% to 20% of TEN patients requiring mechanical ventilation due to deterioration of pulmonary function in the acute setting.¹¹ Chronic pulmonary sequelae were reported by McIvor et al,²⁵ where it was found that three out of four patients had a persistent reduction in carbon monoxide diffusing capacity, evaluated by pulmonary function tests on a 12- to 17-month follow-up. Four patients in our series reported new onset shortness of breath, and two of the four reported scarring in the respiratory epithelium.

Renal diseases, such as acute renal failure and chronic renal insufficiency, occurred in 23% of the TEN survivors in our series. The acute phase of TEN is known to involve disturbances in kidney function¹¹; Revuz et al¹² found that serum urea nitrogen, which is related to both renal function and increased catabolic state, was a statistically significant mortality predictor in the acute phase of TEN, which was confirmed in a study by Engelhardt et al¹⁸ in which acute renal failure in three TEN patients was associated with a 100% mortality. Most of the reported renal lesions in TEN include pre-renal azotemia or acute tubular necrosis,^{12,18} with rare cases of glomerulonephritis also having been reported.²⁶ Despite the fact that renal problems are common in the acute setting of TEN, it is not certain that the long-term decline in renal function is the result of specific TEN-related changes; however, it is important to note that renal problems are known to complicate the course of TEN survivors. Perhaps a larger prospective study may reveal the importance of this long-term complication.

After survival of the acute phase of TEN, 5-year survival was 65% in our population. We found that simple recovery from the acute phase of TEN is not enough for disease-free survival. Long-term complications are common and tend to relate to morbidities

of the patient's acute phase of TEN. We also found survivors of TEN are not at risk of death from specific TEN-related causes after discharge. The initial TEN insult resulting in epidermal break down may have led to long-term organ damage and death in these patients. Two variables from the acute hospitalization, SCORTEN and days from onset of symptoms to admission to a burn center, are significant predictors of postdischarge mortality, and may be used to heighten surveillance during post-discharge care. TEN survivors may require a multidisciplinary follow-up for years after the acute illness, and it is important to educate TEN survivors about these potential complications and to ensure that they receive proper follow-up after discharge.

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