The management of stoma-related skin complications

There are approximately 100,000 people in the United Kingdom living with a stoma (Lee, 2001). Each year in Great Britain, 20,000 new stomas are formed. Skin problems are a common occurrence among this patient group. Careful and thorough history taking will often give clues to the cause of the problem and in combination with a careful physical examination, a correct diagnosis can be made. Simple measures to treat skin excoriation can then be implemented, or in some cases, the patient may require referral to a stoma care nurse for specialist treatment and advice.

Anjela Vujnovich

KEY WORDS
Faecal/urinary skin excoriation
Leakage
Trauma and allergy
Education

Previously, two-thirds of all stomas would have been permanent. As surgery has continued to develop and evolve, it is now estimated that it is an even 50% split between permanent and temporary stomas. Patients may undergo stoma-forming surgery for a variety of reasons, including:

- Cancer of the bowel or bladder
- Inflammatory bowel disease
- Diverticular disease
- Familial adenomatous
- Polyposis
- Ischaemic bowel
- Obstruction
- Incontinence
- Abdominal trauma
- Congenital malformations.

As with any surgery, there is always a risk of complications. With stoma-forming surgery, there is not only an immediate surgical risk such as post-operative bleeding or infection, but also the risk of a stoma-related complication, which can be immediate or delayed. It has been reported that 47% of stoma patients will suffer at least one stoma complication (Lyon and Smith, 2001). Shellito (1998) suggested that the greatest risk of developing a stoma-related complication is usually within the first five years following surgery. Arumugan et al (2003) reported that 50% of patients had developed one or more complications within twelve months after stoma-forming surgery.

Stoma-related complications include:

- Parastomal hernia
- Stoma retraction
- Stenosis of the stoma
- Prolapse of the stoma
- Parastomal granulomas
- Mucocutaneous separation.

While these complications are fairly common, by far the most common stoma-related complication is a skin-related one.

A review of the literature will find figures ranging anywhere from 5% (Shellito, 1998) to 42% (Borwell, 1996); with Lyon et al (2000) suggesting that 73% of people with a stoma will self-report a skin-related complication.

While a minor skin problem may not at first appear to have any serious consequences, it is important to remember that intact skin is essential for the normal use of a stoma appliance (Smith et al, 2002). Any area of skin that has become excoriated, is weeping or bleeding, can cause the stoma appliance to leak. This, in turn, causes the skin to deteriorate further, causing further appliance leaks, hence, the vicious cycle continues. If the patient is experiencing frequent appliance leakage, they will lose confidence in the appliance that they are using which will have a major impact on their activities of daily living and physiological well-being. Patients may report being too scared to leave their house for fear of the appliance leaking.

Skin excoriation can occur at any time and for many reasons (McKenzie and Ingram, 2001). Dermatitis from stoma effluent repeatedly leaking onto the skin is the single most common cause of peristomal skin complications (Lyon and Beck, 2001). Patients who present with a skin complication will usually fall into one of five categories:

- Faecal/urine dermatitis
- Trauma
- Infection
- Pre-existing skin conditions
- Allergy (Lyon and Smith, 2001).

Within each of these categories there will be different causes. Each will have different signs and symptoms that

Angela Vujnovich is Lead Nurse in Stoma Care, St Mark's and Northwich Park Hospital.

will affect individual patients in various ways, as well as having different modes of treatment.

Education of the patient with a new stoma in the immediate post-operative phase can minimise the risk of potential skin problems arising (Vujnovich, 2004). A trained stoma care nurse based in the hospital usually undertakes this. However, as most skin complications will develop after the patient has been discharged from hospital, district and practice nurses will encounter people with a stoma in the community.

This article focuses on faecal or urinary skin excoriation, as this is the most common cause of stoma-related skin complaints. Trauma and allergy will also be mentioned. Treatment for faecal or urinary skin complaints can be commenced by a healthcare professional in the community with some knowledge of stoma and skin care. In instances where treatment has been started with no signs of improvement, the patient should be referred to their stoma care nurse. Skin complaints such as infections and pre-existing skin conditions should be referred to a stoma care nurse or dermatologist, as often the treatment required can impair the adherence of stoma appliances, leading to secondary skin complications.

Faecal or urine dermatitis

Faecal irritant reactions are more common around ileostomies than colostomies, due to the corrosive nature of the effluent. The effluent of ileostomies is strongly alkaline and contains unabsorbed waste products and enzymes that break down protein. Protein is a major constituent of the outermost layers of the skin and protects the skin from harmful substances. The stratum corneum is resistant to quite acidic fluid, but it is more vulnerable to alkaline substances (Stevens and James, 2003). When ileostomy fluid leaks onto the skin, the enzymes break down the protective layers of the skin and cause excoriation.

Urine that is in prolonged contact with the skin will lead to maceration in patients with a urostomy (Collett, 2002). Ideally, urinary pH should be slightly acidic and range between 6–7.5 (Fillingham and Douglas, 1997). An alkaline urinary pH of 7–8 can lead to complications with the peristomal skin and stoma, such as stomal bleeding, ulceration, urinary tract infections, odour and urinary calculi (Fillingham and Douglas, 1997). Eventually, stoma stenosis, pseudoepithelial hyperplasia and hyperkeratosis may occur (Walsh, 1992).

Patient and skin assessment

When first encountering a patient who says that they have excoriated skin, it is important to take a thorough history of the problem. Asking appropriate questions will often give numerous clues as to the cause of their skin complaint (Vujnovich, 2004) (*Table 1*).

All questions should be fully explored to gain a better understanding of the skin complication. Once you have completed taking a history, the next step should be a physical examination of the patient.

Start by looking at the patient's abdomen with the appliance still on. Observe the patient in different positions. Watch how the appliance changes, moves and moulds to the contours of the patient's shape in these different positions. Some appliances may be too rigid for the shape of the patient's abdomen. Skin folds may develop on moving, causing the appliance to lift slightly off the skin, which allows stoma effluent to seep underneath the appliance. It is then important to watch the patient change their stoma appliance. Pay particular attention to how the patient removes the appliance and how they clean and dry their skin. If the patient is roughly pulling their appliance off, this may cause trauma to the skin; likewise, over-vigorous cleaning could destroy the skin.

Table 1.
History of skin problems

Questions to ask:	Rationale:
When did this problem first appear?	Indicates how long the problem has been present
Has the appearance of the excoriation changed?	The excoriation may be improving or worsening, changes may indicate different stages of excoriation
Have you had this problem, or any problem with your skin before?	May suggest past history of pre-existing skin problems
What treatment did you try last time or this time?	Previous treatment that may have been effective in the past, may be effective this time
Do you notice leakage at particular times?	Problems may only be reported at particular times (ie. during exercise, at night, when sitting)
What appliance are you using?	Is this appliance appropriate now?
Are you using any accessories with your stoma appliance?	Allergies are common to accessories rather than stoma appliances
How many times a day/week do you change your appliance?	May indicate too frequent appliance changes or leaving the appliance in place for too long
How many leaks a week do you experience?	Vicious circle of frequent leaks causing deterioration in skin, causing further leaks
How many times a day do you empty your appliance?	Stoma output may be high, the appliance may get too full before emptying, causing drag on the skin
Has the stoma effluent changed?	Stoma output may have increased, become more loose

Once the appliance is off, look carefully at the back of the base plate to assess where any leakage or seepage of effluent has been occurring, subsequently affecting this area of skin. Visible tracks of effluent on the base plate will indicate where stoma effluent has been on the skin.

Now, carefully examine the area surrounding the stoma. The distribution of the excoriation will be determined by the leakage of the stoma effluent on the skin. For the skin to become excoriated it must be in contact with faeces or urine. Pull apart any skin folds to see if the excoriation is present in the folds.

Signs of peristomal excoriation include:

- Well-defined erythema
- Presence of oedema
- Blister formation
- Areas of denuded skin
- In severe cases, there may be necrosis
- The patient may describe a burning sensation at the site
- Itching.

Diagnosing the cause

Your history-taking and physical assessment should have given you clues as to the underlying cause of the skin excoriation. Faecal or urine excoriation will be caused by the following reasons:

- Remodelling of stoma
- Poorly-sited stoma
- Poorly-shaped stoma
- Retracted stoma.

Remodelling of stoma

Most newly-formed stomas are oedematous immediately after surgery. Over the first six to eight weeks this oedema will reduce and the stoma will remodel itself. It is important that a new stoma is measured at least weekly in the first two months. This ensures that the appliance aperture is cut to the correct size for the stoma. It is ideal to see 2–3mm of skin around the stoma. This provides the skin with maximum protection from the corrosive fluid, but is not too tight for the stoma to be damaged by a tight-fitting appliance. After eight weeks the stoma has usually stopped remodelling and pre-cut appliances can be ordered.

During your physical examination you may notice an area of excoriated skin directly round the stoma. The area may appear red and angry, areas of skin may be missing and shallow superficial ulcers and dried blood may be present. Patients will complain of pain or a burning sensation at the site. This may be at the circumference of the stoma, or to one side. A circumferential ring of excoriated skin would indicate that the patient is cutting the aperture in the appliance too large for the stoma, allowing skin to be exposed to faecal or urinary effluent. If the excoriation is only present in one area around the stoma, usually a crescent shape at the bottom of the stoma, it may be that the patient is not lining up the aperture with the stoma in the middle, but slightly off-centre, thereby exposing skin only in one place.

An alkaline urinary pH of 7–8 can lead to complications with the peristomal skin and stoma, such as stomal bleeding, ulceration, urinary tract infections, odour and urinary calculi (Fillingham and Douglas, 1997).

Poorly-sited stoma

All patients having elective surgery that may result in a stoma should be seen pre-operatively by the stoma care nurse for pre-operative education, and to mark the most appropriate site for the stoma. Ideally, the patient's belt line should be avoided, the stoma should be located within the abdominal rectus muscle, all creases, skin folds (*Figure 1*), previous scars should be avoided, and the patient should be able to see the stoma when in various positions, such as sitting and standing. However, in emergency situations, pre-operative siting is not always possible and the surgeon is often faced with the dilemma of where to place the stoma. An abdomen may look flat with no skin creases when the patient is on the operating table, but will change dramatically when sitting or standing.

Poorly-shaped stoma

It is ideal for all stomas to have a spout. Due to the corrosive nature of the effluent, this is more imperative when dealing with ileostomies and urostomies, rather than colostomies. Spouts encourage the effluent to fall out into the appliance, rather than trying to track underneath the base plate onto the skin. The optimal shape of an end ileostomy should have a spout long enough to avoid skin excoriation and should point forwards and slightly downwards (Hall et al, 1995). In the case of a loop ileostomy, the proximal end where the effluent exits should be everted longer than the distal end (Blackley, 1998). All colostomies should have a spout of a few millimetres (Nicholls, 1996) to avoid excoriation (*Figures 2* and *3*).

Retracted stoma

A retracted stoma is where the stoma has shrunk into a skin fold or dip in the abdomen (*Figure 4*). Patients with a retracted stoma will usually report frequent leaks, as the output is not flowing into the stoma appliance but leaking underneath the base plate onto their skin. This will cause the skin quickly to become excoriated, leading to further leaks. Retraction can be caused by: technical difficulties at the time of operation in mobilising the bowel to reach the abdominal surface; failure to site the patient pre-operatively so that the surgeon has to guess the most appropriate position of the stoma; or, weight gain.

Appliance left on for too long

There may be various reasons why a patient leaves their appliance on for too long. Some patients try to use fewer bags to reduce the need for further prescriptions and charges, while others may think that it only needs to be changed when it begins to leak. Of more concern are the people that find their stoma so abhorrent that they try to ignore it, rather than face changing the appliance. These issues must be explored. Patients that are finding it difficult to come to terms with their stoma will need support and reassurance. Counselling from a trained professional may be required.

Figure 1. Poorly-sited stoma in skin folds.

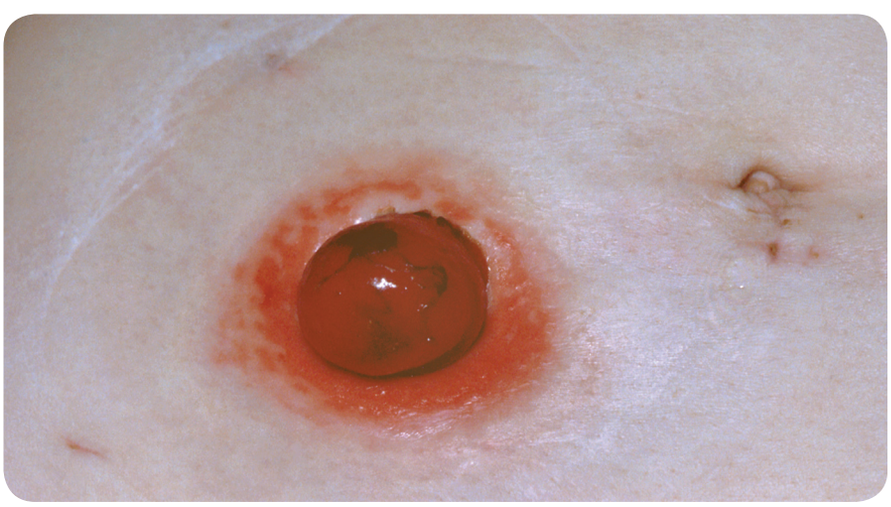

Figure 2. Excoriated skin around the circumference of the stoma.

High output stoma

The normal output for an ileostomy can range from anywhere between 500–1000mls in twenty-four hours. Anything over 1000mls is considered to be a high output. The corrosive nature of ileostomy effluent will damage the skin and erode the stoma appliance quicker. Patients may have to change their appliance more frequently as the appliance will start to erode if left on for long periods.

Treatment of excoriated skin

All excoriated skin should be treated in the same way. Patients should be advised to cleanse the area with warm tap water and dry thoroughly. All stomas should be re-measured using a measuring guide (usually found in the appliance box) to ensure that the aperture of the appliance is cut to the correct size. If the stoma is not round then a template of the stoma shape must be made so that the patient has the correct shape of the stoma to cut the aperture to. It may be beneficial to use a protective barrier such as Cavilon™ No Sting Barrier Film (3M Health Care, Loughborough) (Schuren et al, 2005). On application to the skin, Cavilon™ film forms a waterproof barrier that will act as a protective membrane between the skin and faecal and urinary effluent. The patient should be advised to change the appliance every two days until the excoriation clears up.

If the diagnosis is that the patient has been incorrectly measuring the stoma, then this treatment will heal the skin in a matter of days. However, if the stoma is poorly-sited, poorly-shaped or retracted, these measures alone will not stop the excoriation deteriorating or help it to heal. The underlying cause of this excoriation being the fact that the stoma is poorly-sited, poorly-shaped or retracted and the stoma effluent is tracking underneath the appliance causing the leakage, which then excoriates the skin (*Figure 5*). In these instances, the patient will need assessment from a trained stoma care nurse.

With modern developments of stoma products, situations like these can be managed conservatively without the need for further surgery to re-site the stoma. Accessories, such as paste and seals, can be used to build up creases to enable the appliance to stick to a flat surface. Convex appliances raise the profile of the stoma, or the end pointing downwards, by applying a little pressure around the peristomal skin and forcing the stoma out into the appliance. This encourages effluent to fall out into the appliance rather than tracking underneath the appliance onto the skin. A belt can be attached to the appliance to apply further gentle pressure to raise the profile of the stoma and hold the appliance in place. In extreme cases, paste, seals, a convex appliance and a belt may all be needed to manage the situation conservatively and prevent skin excoriation. If it comes to this level of intervention, it may be more appropriate for the stoma to be surgically re-fashioned or re-sited, although this does not guarantee a trouble-free stoma.

If the underlying cause of the excoriation is weight gain on the part of the patient, and their stoma is now retracted, it may be helpful to advise the patient to lose weight. If the stoma has sunk because of the skin folds, it may be necessary to use a convex appliance.

All patients with a high output stoma should be given a barrier protection agent, such as Cavilon™ No Sting Barrier Film, as a prophylactic to avoid skin excoriation, rather than treating it after it has occurred.

Figure 3. Stoma with excoriation tracking along skin crease.

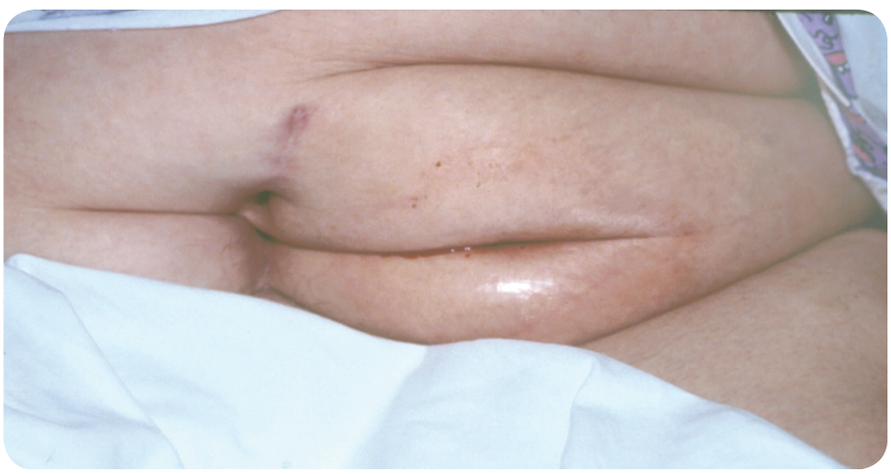

Figure 4. Retracted stoma in skin folds.

Figure 5. Excoriation around the stoma. Note the ulcers directly under the stoma, and to the left and right, caused by over-frequent appliance, removal and over-vigorous cleaning to the area. The stoma is also flush with the skin, potentially causing effluent leakage to the skin.

Physical irritation

Physical irritation specifically refers to trauma caused to the skin by factors such as rubbing, pressure, the patient's appliance change technique, or radiotherapy. Causes of physical irritation include:

- Frequent appliance changes
- Poor change technique
- Treatment of trauma
- Radiotherapy and chemotherapy.

Frequent appliance changes

When an appliance is changed too frequently, the outer skin cells that provide the skin protection are constantly being stripped off. The skin will have a similar appearance to excoriation caused by effluent leaking onto the skin. It will appear excoriated which may be weeping or bleeding, and areas of skin may be denuded or ulcerated.

Poor change technique

Patients should always be observed changing their appliance to assess their technique (Myers, 1996). Patients may strip their appliance off their abdomen as quickly as possible without supporting the skin. Vigorous rubbing of the skin when cleaning to ensure that all traces of effluent are removed, can also lead to damage. Some patients may have difficulty in lining up the aperture with the stoma, and may be placing it off-centre, thereby exposing the skin to effluent on one side.

Treatment of trauma

There are many different recommendations as to the frequency of appliance changes. Drainable, one-piece appliances or the base plates of two-piece appliances can be changed anywhere from every day to every four days. The average wear time is two to four days (Allen, 1998). If the peristomal skin is in excellent condition, the patient can decide what is the best routine for them. As long as their skin stays in perfect condition, this is acceptable. However, if they leave their appliance on for several days and their skin begins to deteriorate, they must change their appliance more frequently. For colostomists, it is suggested that they should change their one-piece closed appliance as necessary (Black, 2000), which may be once or twice daily, depending on their output.

A careful assessment must be taken to understand why the appliance is being frequently changed. It may simply be that the appliance is inappropriate for the stoma effluent, and changing to a more appropriate one would solve this problem. On questioning, some patients will report feeling dirty with faeces sitting in the appliance on their abdomen and they only feel clean when they change the appliance. In these cases, patients require support and advice. Explain to the patient the damage that frequent appliance changes, or over-vigorous removal or cleaning and drying does to their skin by repeatedly removing its protective layers. Patients should be encouraged to gently remove their appliance using one hand to pull the appliance, while

the other supports the skin. The patient should demonstrate placing the new appliance in place. Two-piece appliances, where the base plate can be left in place for several days, and the patient can change the bag as needed, will allow the skin to repair itself in-between base plate changes. Patients who experience difficulty lining the aperture with the stoma may find a mirror useful, or a two-piece appliance where they can line the aperture and the stoma up and then clip the bag in place.

Radiotherapy and chemotherapy

Skin problems related to radiotherapy and chemotherapy are relatively uncommon. Often the most common side-effect after chemotherapy and radiotherapy is diarrhoea, which can lead to appliance leakage problems and excoriated skin. When patients are experiencing diarrhoea during the course of their treatment, drainable appliances or a two-piece system (where the base plate can be left in place for several days, but the bag changed as needed) should be used while the diarrhoea persists.

The severity of skin reactions after radiotherapy will depend on the total dose of radiation, the size of the area being treated, and the condition of the skin before commencing radiotherapy. Skin breakdown is most likely to occur in moist areas, skin folds, such as the groin, or in areas of recent surgery, such as the perineal region after an abdominal resection (McGrath and Fulham, 2004).

Skin damage following radiotherapy can be classified as:

- **Erythema** — skin becomes pink, dry and itchy, may have a rash-like appearance or spots, and feels hot and appears similar to sunburn. It occurs two to three weeks after commencing radiotherapy and resolves two to three weeks after stopping therapy.
- **Dry desquamation** — characterised by dry, flaky, superficial skin loss which is often itchy. It is often the precursor of moist desquamation, especially if onset is early in treatment. It occurs two to three weeks after commencing therapy.
- **Moist desquamation** — skin blisters and sloughs off exposing the dermis. Raw skin may be apparent and bleeding may occur. Exudate may be serous, white, yellow or green.
- **Necrosis** — this rarely occurs (Faithful, 2001).

Occasionally, patients can develop stomatitis when receiving some chemotherapy agents. These include 5-flurouracil, methotrexate, doxorubicin, bleomycin and mitomycin C. The stoma can become oedematous and inflamed. This will not cause the patient any pain, as the stoma has no nerves. Patients should be advised that they might need to adjust the aperture of their appliance to fit the oedematous stoma correctly (Porrett and McGrath, 2005).

If the patient has skin creases, it is important to pull them apart to look for excoriation. If there is excoriation in the creases, it is likely that faeces or urine are tracking along these creases causing the problem.

Prevention and treatment

Any patients undergoing radiotherapy should seek advice about skin care from the centre providing their treatment. Different centres will have varying recommendations for prevention of damage. Patients should be advised to wash the skin within the treatment area with a mild soap. Moisturising creams should be applied, although alcohol, petroleum, lanolin (Korinko and Yurick, 1997), and metallic-based creams, such as zinc (Lyon and Smith, 2001), should be avoided. Moisturising cream will hydrate the skin. To help soothe the erythema the moisturiser may be placed in the fridge before use. Creams should not be applied within two hours prior to treatment. If patients need to shave their abdomen to enable the stoma appliance to adhere to the skin, they should be advised to use an electric razor rather than a wet razor while receiving radiotherapy. Perfumed products should not be used in the treatment area. Loose clothing, preferably made from natural fibres, should be worn to prevent friction over the area. Any exudate should be blotted dry with sterile gauze. Moist desquamation should not be routinely cleaned unless there is evidence of infection. Trauma of repeated cleansing will increase desquamation and damage granulating tissue.

Allergy

It is important to mention allergy (*Figure 6*), as most patients will report that their excoriated skin is due to an allergy to their appliance. A true allergy to a stoma appliance is rare and only accounts for 0.6% of stoma-related skin problems (Lyon and Beck, 2001). Suspected skin allergy from stoma products can be broken down into two categories; namely, an allergy to:

- The appliance
- Accessory products.

Assessment

Signs and symptoms of skin allergy include:

- Erythema
- Margins are indistinct and blurred and may spread beyond the area of the appliance
- Blister formation
- Papules and vesicles are often seen
- Lesions may become painfully eroded and crusted
- Itching.

When examining the skin, it is important to look at the distribution of the excoriation on the skin surrounding the stoma. This will often give the best clue as to the cause of the dermatitis. The skin must be in contact with the appliance to develop an allergic reaction to a stoma appliance. If the patient has skin creases, it is important to pull them apart to look for excoriation. If there is excoriation in the creases, it is likely that faeces or urine are tracking along these creases causing the problem. If the skin crease shows no signs of excoriation, an allergy may be the cause of the

Figure 6. Allergy to stoma appliance.

excoriation. While patients can develop an allergy to stoma appliances, it is more common to develop an allergy to a stoma accessory, such as a fragranced stoma bag deodoriser. In several European studies, fragrances have been demonstrated to be second only to nickel as a cause of allergic contact dermatitis (Lyon and Beck, 2001). It is essential to watch the patient do a complete appliance change. The patient may be using potentially irritant substances, such as a deodoriser, perfumed cleansers, or medicated wipes.

Treatment

Patients should be advised to wash their skin with lukewarm tap water. Perfumed products should be avoided and the use of barrier preparations should only be used if advised by a clinician who has experience in the field of stoma and skin care. Any accessories the patient is using should be stopped immediately.

If an allergy to an appliance is diagnosed, the patient should change the type of appliance to one with a different adhesive, flange or wafer. True allergic dermatitis will resolve when the patient is no longer exposed to the allergen (Lyon and Beck, 2001). The application of a topical steroid to the allergy may hasten its resolution.

Testing for allergy

If an allergy is suspected, a usage test can be tried. Usage testing involves the patient placing the same appliance and any accessories they may be using on the opposite side of their abdomen to their stoma. These will be left on for several days to see if any rash develops. This test will only demonstrate that the patient is sensitive to some component of their stoma products. Further investigations may be required.

Patients requiring patch or prick testing should be referred to a specialist dermatology department with experience in performing this test (Lyon and Beck, 2001). An allergy to a stoma appliance or accessory can be confirmed with a positive patch test. Appliance manufacturers are often willing to give information about compounds used in their products so that the source of the allergy can be identified and avoided in future product usage (Lawson, 2003).

Conclusions

Skin problems are common among patients with a stoma. Patients may develop a skin problem for a variety of reasons, many of which are beyond their control. Careful and thorough history-taking will often give clues as to the cause of the problem. Combine this with a careful, physical examination and a correct diagnosis can usually be made. Simple measures to treat skin excoriation can be commenced by healthcare professionals with a basic knowledge of stoma and skin care. In some cases, patients may need to be referred to a trained stoma care nurse for specialist advice and treatment regarding stoma appliances. WUK

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Key Points

- Approximately 100,000 people in the United Kingdom are living with a stoma (Lee, 2001).
- Any area of skin that has become excoriated, is weeping or bleeding, can cause the stoma appliance to leak.
- Dermatitis from stoma effluent repeatedly leaking onto the skin is the single most common cause of peristomal skin complications (Lyon and Beck, 2001).
- Patients that are finding it difficult to come to terms with their stoma will need support and reassurance.
- All excoriated skin should be treated in the same way. Patients should be advised to cleanse the area with warm tap water and dry thoroughly.
- Often the most common side-effect after chemotherapy and radiotherapy is diarrhoea, which can lead to appliance leakage problems and excoriated skin.
- Suspected skin allergy from stoma products can be broken down into two categories; namely, an allergy to: the appliance or accessory products.

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