Case Study

Bilateral pitting oedema with multiple aetiologies

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Oedema is the accumulation or retention of fluid within the interstitial spaces. Rather than being a problem of fluid excess, oedema indicates a problem with fluid distribution where fluid moves out of the capillaries or lymphatics into the surrounding tissues (McCance and Heuther 2010).

Symptoms of oedema can involve swelling of body tissues or can be more systemic to include weight fluctuation, general tightness and stiffness in the body (McCance and Heuther 2010). Depending on the site and cause of the swelling, oedema is categorised as either local or generalised (Jarvis 2004).

Local oedema may occur around the site of direct trauma such as in a sprained ankle (Jarvis 2004) or may be a sign of more serious disease such as ascites of an injured or infected organ (Hastings 2005). Generalised oedema often presents in the feet and legs as gravity pulls the fluid into the lower extremities (McCance and Heuther 2010). Generalised oedema can be recognised by using two fingers to press away the fluid in the tissues around the nearest bone. If a pit is left in the skin, pitting oedema becomes the diagnosis (McCance and Heuther 2010).

Known aetiologies for oedema include a high salt intake (Hastings 2005), hormonal dysfunction associated with the menstrual cycle (Rosenfeld et al 2008), medications such as the oral contraceptive pill (Gorman et al 2001), allergic reactions, and infections and inflammation (McCance and Heuther 2010). More serious causes can include trauma (Katayama and Kawanmata 2003), burns (Demling 2005) and cancer (McCance and Heuther 2010).

Presenting complaint

'Lauren', a 24 year old speech pathology graduate, presented with bilateral fluid retention in her ankles. The fluid was pooled around the ankles and feet, becoming less evident a few centimetres above the top of the anklebone. There was no numbness or discomfort, only heaviness in the legs. Pitting was evident around the ankles and Lauren noted that she had recently put on 5 kg and was feeling puffy and swollen in her hands, stomach and legs.

The fluid build-up in her ankles began five years ago, coinciding with Lauren moving out of home to attend university, changing her diet, ceasing regular exercise, increasing her alcohol intake and starting the oral contraceptive pill (OCP). Over the past 12 months, the swelling had worsened to the point that at times her ankles would 'disappear'. It was unclear as to why the symptoms had worsened over this period, which correlated with her GP's diagnosis of idiopathic oedema. Lauren commented that the swelling was noticeably worse in hot weather, when she was stressed, and a few days before her period. Lauren could not identify anything that relieved the swelling.

In addition to the ankle swelling and generalised fluid retention, Lauren reported that her menstrual cycle symptoms had increased and she was experiencing mood changes (irritability) and increasing levels of menstrual pain. All these symptoms began two days prior to her period. On further questioning we determined that both physical and mental symptoms resolved with onset of the menstrual flow. In general, Lauren described herself as a 'stressy' and emotional person and her boyfriend had been commenting that she was getting much more irritable with each cycle.

Lauren explained that she was often exhausted from her busy social life and commented that she often did not get enough recovery time. She woke 1-2 times during the night to urinate and the disturbed sleep was adding to her fatigue. Lauren was also experiencing diarrhoea which was aggravated by her menstrual cycle and within a few hours of consuming milk. The diarrhoea did not affect the ankle swelling, but did impact on the generalised fluid retention.

It is significant that the oedema began when Lauren moved out of home and began to eat poor quality meals; however, at the time of consultation, Lauren's diet was high in fruit and vegetables, with only occasional junk food. Most days Lauren would drink 2-3L of water. Lauren continued to binge drink on weekends and consume milk and cheese most days even though it often resulted in diarrhoea. Additionally, her protein intake was low – although she enjoyed meat, she found it cheaper and easier to cook and prepare high carbohydrate meals based on pasta and bread. Lauren also admitted to being a 'salt addict', adding salt to all her meals.

Lauren enjoyed exercise, but at the time of this appointment was doing very little and, at most, would ride her bike for 30 minutes twice a week.

Medical history

Lauren's childhood medical history was unremarkable with no major illness or injuries. She had not caused any trauma to her ankles that she could remember. Prior to her naturopathic appointment, Lauren had been under the care of her GP and had been given the diagnosis of idiopathic oedema without any treatment. She had not tried any natural remedies for her oedema or premenstrual syndrome (PMS) and was managing the

pain with paracetamol for two days of every month. She was currently taking the OCP.

Pathology and Investigations

Lauren's GP had referred Lauren for pathology testing. Pathology tests included full blood examination (FBE), thyroid-stimulating hormone (TSH), serum electrolytes, liver-function tests and lipid profile. These results showed nothing of clinical significance and her GP had not recommended any intervention. The above tests are the standard first line of testing for this type of oedema.

Aside from the pathology tests, typical clinical investigations for oedema include palpation to determine pitting, pain and tenderness, examination of lymphatic groin nodes to rule out the possibility of cellulitis, and examination of the leg and foot to determine if ulcers, colour change, temperature change or gangrene are present (Jarvis 2004). During the naturopathic consultation, pitting was the only one of these that was observed.

If the swelling is severe it is recommended to measure the circumference of the ankles with a tape measure to rule out a diagnosis of deep vein thrombosis (DVT) or specific lymphoedema (Jarvis 2004). This was not done in this case, but would have been an objective way to measure improvement.

Family and social history

Lauren's mother, maternal grandmother and sister all had varicose veins. Both paternal and maternal grandfathers had passed away from heart attacks. Lauren's father had a heart attack at age 67 and was currently on several medications to prevent further complications.

Observations and physical examination

Lauren was slightly overweight (5kg) with a waist circumference of 90cm.

Clinical observations in this consultation included tongue, iris and nail examination. Her tongue and nails showed no abnormalities, but her iris showed a lymphatic rosary and she had dark circles under her eyes. At the time of consultation, Lauren did not look 'puffy' in her hands or face but she explained that this was always worse in the morning and with her menstrual cycle. Palpation at the medial malleolus (ankle) showed grade 2 oedema. The oedema was measured by the depth of the pitting in centimetres (Jarvis 2004). Lauren noted that her bowels were most often type 4 on the Bristol stool chart.

Diagnosis

Pitting was evident around both ankles where the fluid retention was most severe, but there was no evidence of trauma or injury to the ankles. The patient also suffered from general body puffiness and weight gain which fluctuated with the menstrual cycle. All of these factors are supportive of the diagnosis of idiopathic pitting oedema made by her GP following blood tests that showed nothing of significance.

Treatment

The initial consultation focused on determining the underlying causes of the oedema. Lauren had bilateral pitted swelling of the ankles which can be indicative of a systemic problem such as heart failure, liver cirrhosis or nephrotic syndrome (Jarvis 2004). Given her young age and that the pathology results for liver function tests (LFT) and serum electrolytes were all clear, these were unlikely. Although pathology testing showed nothing of significance, the naturopathic clinical examinations and observation, combined with a complete case history, were helpful in recognising some of the underlying causes and formulating a treatment plan.

The main underlying causes identified in this case were diet (high salt), allergy or intolerance (to dairy) and hormonal imbalance. These are all known causes of oedema (Hastings 2005, Rosenfeld et al 2008, McCance and Heuther 2010). Her sedentary lifestyle, in combination with the iridology signs that suggested lymphatic involvement (i.e. lymphatic rosary), were also significant as poor movement of lymphatic fluid around the body may contribute to generalised fluid retention (Miller 2008).

The treatment aims following the first consultation were to alleviate the diarrhoea (possibly from dairy intolerance), improve hormonal balance and reduce the fluid retention. These aims focused on all of the identified causes. The treatment aims were achieved through diet and lifestyle modifications combined with herbal and nutritional supplementation.

Diet

An allergy or intolerance can be a cause of generalised oedema and Lauren noticed an obvious reaction in her bowels after eating dairy. A dairy allergy had not been formally diagnosed but it was thought that intolerance was possible. She was advised to remove dairy for a full 4 weeks to determine if this would improve her diarrhoea and subsequently her oedema. High salt intake has been linked to fluid retention (Hastings 2005) and Lauren committed to restricting her salt intake to a small pinch daily.

She was advised to include an extra handful of fresh vegetables daily to improve her potassium/sodium balance. Despite drinking 2-3 L of water daily, Lauren was still experiencing long-term oedema. Drinking lots of water can help to reduce fluid retention by flushing out metabolic waste; however, this requires healthy intracellular function (Hastings 2005). Her water intake was adequate and it was hoped that fluid retention would improve without the need for further water supplementation.

Lifestyle

Lifestyle recommendations included an Epsom salt bath once a week and daily dry skin brushing. These are traditional naturopathic methods used to increase circulation and distribute fluid more evenly around the body. They may be useful for generalised oedema.

Herbal/nutritional medicines

Lauren was happy to partake in dietary change and also herbal and nutritional supplements. The following herbal and nutritional tablet (see Table 1) was chosen to reduce the oedema. In particular, *Arctostaphylos uva-ursi, Galium aparine, Equisetum arvense,* B1 and B6 are noted for their diuretic actions. Although the dose of vitamins B1 and B6 are low (total 30g and 26g/day respectively), they combine well with the herbs to potentiate diuretic action (Braun and Cohen 2010). Quercetin and vitamin E may be beneficial for oedema with cardiovascular, allergenic or venous aetiology (Braun and Cohen 2010). On observation, Lauren did not have direct signs of overt cardiovascular or venous pathology, but she has a strong family history of both conditions.

The following herbal tincture (see Table 2) was prescribed for the dysmenorrhoea and mood. The aim of this mixture was to reduce smooth muscle spasm in both the bowel and uterus (*Matricaria recutita, Angelica sinensis*), reduce congestion in the uterus (*Paeonia lactiflora, Angelica sinensis*), balance oestrogen and progesterone levels (*Rhodiola rosea, Paeonia lactiflora and Angelica sinensis*) and support mood (Bone and Mills 2013).

BioQ150 (Healthworld, Northgate, Australia) was also prescribed and Lauren was to take 1 capsule daily in the morning. CoQ10 can improve oedema through strengthening the capillaries so as to reduce fluid leakage into the tissues (Braun and Cohen 2010). Lauren did not have overt signs of varicose veins, but she had a strong family history of both cardiovascular disease and venous weakness. CoQ10 may be prescribed as a long-term preventative measure based on her family history and the connection between cardiovascular illness, vein insufficiency and oedema.

Follow up (after 1 month)

The oedema had started to improve by the end of four weeks and Lauren remarked that she could see her ankles for the first time in five years. On this visit the oedema was still present but improving. Her digestion was much improved with no bloating and bowel function returning to normal. She found dairy easy to avoid. She had eaten cheese once with obvious loose bowels and bloating within 20 minutes and so was happy to abstain from dairy in the longer term. Her mood was also greatly improved and she remarked that she felt like her normal happy self again. However, she had finished the liquid herbs one week prior to her second appointment and had noticed some moodiness again.

Treatment

In the second consultation Lauren was taught to track her oedema (by palpation) and was instructed to keep a diary of the fluctuations. Otherwise, the treatment plan was to keep all medications the same to allow the fluid to completely drain and the lymphatic system to repair.

Table 1: Herbal and nutritional tablet

Herb	Total
Galium aparine, whole plant dry	3 g
Arctostaphylos uva-ursi, leaf dry	1.1 g
Equisetum arvense whole plant dry	500 mg
Quercetin	100 mg
Thiamine hydrochloride (B1)	15 mg
Pyridoxine hydrochloride (B6)	13 mg
d-alpha – Tocpheroll acid succinate Equiv. Vit E	83 mg 100 IU

Dose: 1 tablet morning and night with meals

Table 2: Herbal tincture

Herb	Conc.	Total
Matricaria recutita	1:2	25 ml
Angelica sinensis	1:1	25 ml
Paeonia lactiflora	1:2	25 ml
Rhodiola rosea	2:1	25 ml
TOTAL		100 ml

Dose: 5 ml morning and night.

Follow up (after 2 more months)

Lauren's ankles continued to improve with very minimal swelling. Through tracking the oedema in her diary she had noticed that the swelling would fluctuate and, apart from very hot days, the swelling was minimal. Lauren had had another period and the swelling had been minimal.

With the improvement to her health, Lauren had started to exercise daily; however, her life had become very hectic with no weekends at home in three months due to social engagements. As a result, Lauren was feeling much more teary and emotional and the liquid herbs did not seem to be working as well as they had previously.

Treatment

Ongoing treatment was aimed at continuing the herbal tablet and CoQ10 to prevent any further build-up of fluid in the legs. At this appointment there was a discussion about Lauren's need to rebalance her recreational time as she was finding it difficult to balance full time work with such a busy social life. She decided to commit to one weekend at home each month without any social engagements.

The previous herbal tincture was changed (Table 3) to better support the adrenal glands whilst she integrated some changes to her lifestyle. As her digestion had greatly improved since stopping the dairy products, it was decided that *Matricaria recutita* was no longer required. Lauren was tired from her busy lifestyle and to give stronger adrenal support *Rhodiola rosea* was replaced with *Panax ginseng* and *Glycyrrhiza glabra* (Bone and Mills 2013). Although Lauren's period pain

Table 3: Modified herbal tincture

Herb	Conc.	Total
Panax ginseng, root	1:2	20 ml
Angelica sinensis, dry root	1:1	20 ml
Bupleurum falcatum, root dry	1:2	20 ml
Glycyrrhiza glabra, root dry	1:1	20 ml
Paeonia lactiflora, root dry	1:2	20 ml
Zingiber officinale, root dry	1:2	10 ml

5 ml 3x a day for 1st cycle then reduce dose to 5 ml morning and morning.

had improved, the long term support of *Bupleurum falcatum, Paeonia lactiflora* and *Angelica sinensis* would continue for two more cycles.

Ongoing Plan

Lauren's treatment plan will need to continue until her ankle oedema has resolved completely. The aim at this point is to revise in 3 months.

Discussion

One of the most interesting aspects of this case was that, although Lauren's condition was medically diagnosed as idiopathic oedema (oedema of an unknown cause) there were many possible causes from a naturopathic perspective. A comprehensive case history, in combination with naturopathic observations and clinical testing, can shed light on further underlying causes. It was only after these had been identified and addressed that improvement was made for this patient. This suggests that even when an idiopathic diagnosis is made and pathology tests come back clear, it is still worthwhile to look deeper for an underlying cause.

Although ankle oedema can be a sign of a more severe medical condition (Hastings 2005), it may also be due to much less sinister faulty mechanisms such as menstrual-cycle imbalances (Rosenfeld et al 2008) and allergy (McCance and Heuther 2010). Poor diet and lifestyle choices may exacerbate this (Hastings 2005). A combination of these factors was enough to cause high levels of oedema in Lauren's ankles.

From a naturopathic perspective, the notion of the lymphatic system/fluid can mean peripheral oedema from causes other than the specific lymphatic structures, such as the vascular structures (Miller 2008). With this in mind, Lauren's family history of varicose veins and cardiovascular disease becomes clinically relevant, as does the lymphatic rosary observed in her iris. Thus it would appear that strategies for improving diuresis and circulation are helping to resolve her symptoms. It is most likely that Lauren's predisposition towards this type of lymphatic stagnation was exacerbated when she commenced university and started eating a more processed (high salt/low potassium) diet. Given that there are both genetic and lifestyle related aetiologies, it was important to approach Lauren's case from both a symptomatic and preventative viewpoint.

Lauren is very compliant with all medications and advice given and the treatment appears to be working well. In the future it will be important to move to a more preventative strategy to maintain long term results.

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