The hair that shed was validated (shedding), and it was correlated on the best amount of hair shedding and excessive thinning of her scalp hair over the preceding 12 months.

Her scalp appears healthy, she is otherwise well, her thyroid function tests are normal, and she passed through a trouble-free menopause five years previously. She takes no medications.

**Commentary**

Vera loss androgenetic alopecia.

Androgenetic alopecia produces hair loss in a reproducible pattern called female pattern hair loss (FPHL).

The pattern of hair loss in women is different than that in men. Women with FPHL present with increased hair shedding or diffuse reductions in hair volume over the mid-frontal scalp, or both.

The hair loss (density) can be graded clinically using a validated visual analogue scale.

**DISCLOSURE OF OFF-LABEL USE**

The following drugs are not FDA approved for the treatment of androgenetic alopecia:

- Cyproterone Acetate
- Spironolactone
- Dutasteride
- Flutamide
- Bicalutamide
- Oral Minoxidil
- Bimatoprost

**Haemosiderosis**

- Haemosiderosis has been linked to traumatic hair loss due to injuries, as well as with certain systemic conditions such as haemochromatosis and amyloidosis.
- Hair loss due to haemosiderosis may be associated with iron deposition within the scalp, which can lead to a characteristic 'orange peel' appearance of the scalp.

**A really useful question:**

When you tie your hair back in a ponytail, how thick is your ponytail compared to 5 or 10 years ago, before you started losing hair?

**Hair shedding scale**

Hair loss (shedding) can also be scored as a validated visual analogue scale.

The women were asked to look at an A4 page containing the 5 photos of hair bundles and to point to the photograph that best described their hair loss.

Below is the frequency of hair washing, and the results were scored on a scale of 0-8.

**Hair Pull Test**

- The hair pull test can be used to confirm increased hair shedding.
- Shedding may be localized to the crown or generalized.

The hair pull test. Around 10 hairs are grasped firmly at the scalp between the thumb and index finger, traction is applied as the hairs are pulled along their length.
Differential Diagnosis

- So-called senescent or age-related alopecia has been postulated as a distinct entity but evidence for this is lacking.
- Chronic telogen effluvium (CTE) is an important differential diagnosis in women with increased hair shedding but no visible baldness. CTE is a distinct clinical entity that does not evolve into FPHL and is due to a variance in the range of anagen duration rather than shortening of anagen, as seen in FPHL.
- CTE can be excluded in this case.

Do you have any questions?

Is this common?

- FPHL is common and has a negative impact on a woman’s quality of life.
- In Australia, there are estimates to be about 2,000,000 women with stage 2 and 700,000 with stage 3 severity hair loss.
- Hairdressers spend half their working week setting hair for women with stage 4 and 5 FPHL

<table>
<thead>
<tr>
<th>Stage</th>
<th>Hair Severity</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>198</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>578</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>718</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>247</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>195</td>
</tr>
</tbody>
</table>

Table 4: Hair Patterns in Female Subjects * adjusted to age

Do I need any tests?

- Systemic androgen excess (virilisation or iatrogenic), thyroid disease and iron deficiency are potential aggravating factors that accelerate hair loss.
- Treatment of thyroid disease or iron deficiency alone will not regrow hair.
- FPHL is associated with metabolic syndrome, NIDDM, hypercholesterolaemia and hypertension

No-one else in the family has it! Why did I get this?

- FPHL has a complex polygenic aetiology, being associated with several genes involved in androgen metabolism or oestrogen activity, including those for oestrogen receptor beta and aromatase.
- Epigenetic phenomenon are also likely to be involved.
- Androgen binding to hair follicle androgen receptors is important in the pathogenesis

What is this the diagnosis?

- Is this common?
- No-one else in the family has it! Why did I get this?
- Do I need any tests?
- What is happening to my hair?
- Do I need to treat it? What happens if I do nothing?
- What are the treatments options?
- How long does the treatment take?
- Will I need to be on treatment for life?
- How does the treatment work?
- Are there any side effects?
- Will the shedding stop?
- What if the treatment doesn’t work?
- Should I have a transplant?
- Will my daughter be affected? When should I send her along?
What exactly is happening to my hair?
Do I need to treat it? What happens if I do nothing?
What are the treatments options?

- Treatment of FPHL involves use of oral antiandrogens such as spironolactone or cyproterone acetate to arrest progression of hair loss, and use of topical minoxidil 2% or 5% solution to stimulate hair regrowth.
- For patients intolerant of or unresponsive to these agents finasteride, dutasteride, flutamide or bicalutamide are alternatives
- None of these agents are FDA approved for the treatment of hair loss
- Flutamide and Bicalutamide require careful monitoring of liver function.

How long does the treatment take?
Will I need to be on treatment for life?

<table>
<thead>
<tr>
<th>Baseline</th>
<th>6 months</th>
<th>12 months</th>
<th>24 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyproterone acetate 100mg for 10 days per month</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How much hair will I regrow?

<table>
<thead>
<tr>
<th>Baseline</th>
<th>6 months</th>
<th>12 months</th>
<th>24 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>6 months</td>
<td>12 months</td>
<td>24 months</td>
</tr>
<tr>
<td>Spironolactone 200mg per day</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Flutamide 250 mg daily in non-responder to spironolactone

What if the treatment doesn’t work?

Before

After 12 months

Flutamide 50 mg daily and Oral Minoxidil

What if the treatment still doesn’t work?

Before

After 6 months

What else can I do?

Bimatoprost

Week 0

Week 8

Week 16

PRP?
• How often?
• How long for?

What if the treatment doesn’t work?

Bimatoprost

What if the treatment still doesn’t work?

Laser Hair Comb?
• What waveband?
• What dose?
• How long for?
• How Frequently?
Should I have a transplant?

Pre transplant 4 weeks post transplant 1600 grafts 6 months post transplant

So what did I prescribe this woman?

Spironolactone 25 mg, Minoxidil 0.25 mg capsule, Once daily and review at 3 and 6 months
Oral Minoxidil for FPHL

Minoxidil is a FDA approved oral anti-hypertensive medication used in doses up to 100mg daily.

Minoxidil stimulates hair growth, but its use in female pattern hair loss (FPHL) is limited by potential adverse events including postural hypotension, fluid retention and hypertrichosis.

Oral Minoxidil for FPHL

Spironolactone is another FDA approved oral antihypertensive with antiandrogen activity. Spironolactone may arrest hair loss in FPHL and produce some hair regrowth in women with FPHL.

Oral Minoxidil for FPHL

To investigate the use of oral minoxidil and spironolactone in FPHL, 100 women with a Stage 2-5 FPHL were enrolled in a pilot study and followed for 12 months.

Validated 5 point hair loss visual analogue scale

Oral Minoxidil for FPHL

Hair shedding was scored using a 6 point visual analogue scale.

Hair density was scored using a 5 point visual analogue scale.

Oral Minoxidil for FPHL

- Mean age was 48.44 years (range 18-80).
- Mean hair loss severity at baseline was Sinclair 2.79 (range 2-5).
- Mean hair shedding score at baseline was 4.82.
- Mean duration of diagnosis was 6.5 years (range 0.5 - 30).
- Mean change in blood pressure was -4.52mmHg systolic and -6.48mmHg diastolic.
- Side effects were seen in 8 of women but were generally mild. Six continued treatment while 2 women who developed urticarial discontinued treatment.

Oral Minoxidil for FPHL

Mean reduction in hair loss severity score was 0.85 at 6 months and 1.3 at 12 months.
**Oral Minoxidil for FPHL**

Mean reduction in hair shedding score was 2.3 at 6 months and 2.6 at 12 months.

**Oral Minoxidil for FPHL**

In this prospective uncontrolled open label observational pilot study, once daily minoxidil 0.25mg and spironolactone 25 mg appears to be safe and effective in the treatment of FPHL.

Ethics approval obtained to initiate phase IIb, multicentre, placebo controlled, dose ranging study with an active comparator to investigate this further in women.

**Oral Minoxidil for MPHL**

Ethics approval has also been obtained to initiate phase IIb, multicentre, placebo controlled, dose ranging study with an active comparator in men.

**Oral Minoxidil for CTE & Trichodynia**

Oral Minoxidil Monotherapy for CTE & Trichodynia

36 women
- 6 month history of increased telogen hair shedding
- no visible mid frontal scalp hair loss (Stage 1)
- no hair follicle miniaturization on scalp biopsy
- 6 months treatment with minoxidil in doses between 0.25 mg and 2.5 mg daily

Hair shedding scores at baseline, 6 and 12 months were analysed using the Wilcoxon rank sum test for pair-wise comparisons.
- Mean age was 46.9 years (range 20-83).
- Mean hair shedding score (HSS) at baseline was 5.64.
- Mean duration of diagnosis was 6.55 years (range 1-27).
Oral Minoxidil for CTE and Trichodynia

- Reduction in mean HSS scores was 1.7 (p<0.001) at 6 months and 2.58 (p<0.001) at 12 months.
- Five women described trichodynia at baseline, all noted improvement or resolution within 3 months.
- Two patients developed transient postural dizziness that resolved with continued treatment. One patient developed ankle oedema. Thirteen women developed facial hypertrichosis. For 6 women this was mild and did not require treatment.

Oral Minoxidil for Parietal Hair Loss

Oral Minoxidil for Bi-temporal Recession

Week 0  Week 24

Oral Minoxidil for Miscellaneous Hair Loss

- Monilethrix
- Chemotherapy induced hair loss
- Alopecia areata
- Cicatricial alopecia
- Frontal fibrosing alopecia

Oral Minoxidil

- Over a 10 year period 3725 distinct patients with hair loss were treated with oral minoxidil in doses ranging from 0.1mg daily to 20mg daily.
- There were 989 men and 2736 women.
- Patients were generally commenced on a low dose and reviewed at 3 monthly intervals. When necessary, doses were escalated.
- In the men, minoxidil was used either alone as monotherapy (62) or together with finasteride (912) or dutasteride (15).

Oral Minoxidil and Pericardial Effusion

- In women, minoxidil was used either alone as monotherapy (805) or together with spironolactone (1228), cyproterone acetate (636), flutamide (11), bicalutamide (5) or spironolactone/flutamide (57).
- There were no cases of syncope, tachycardia or pericardial effusion identified. No ECG abnormalities.