NEWBORN PHYSICAL EXAM

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Objectives

1. Describe common newborn exam findings that are normal
2. Identify newborn exam findings that are abnormal and need further evaluation
3. Review important newborn physical exam techniques

Case 1

- Infant born at 40 weeks gestation, no complications
- Parents are concerned about skin peeling and worried that the baby is dehydrated

Case 1



Photo by Janelle Aby, MD
http://med.stanford.edu/newborns/professional-education/photo-gallery/skin.html#normal_peeling

Case 1: Normal Skin Peeling

- Skin peeling is normal, and occurs in both term babies and babies born post-dates
- Reassurance can be provided
- Lotion or cream is not needed, however if parents desire to use it, it should be unscented

Case 2

- Infant born at 40 weeks gestation, no complications
- Parents are concerned about skin peeling and worried that the baby is dehydrated

Case 2



Photo by Janelle Aby, MD
https://med.stanford.edu/newborns/professional-education/photo-gallery/skin.html#icthyosis

Case 2: Ichthyosis

- Ichthyosis: genetic disorder of impaired keratinization
- High risk of infection, fluid and heat loss due to impaired barrier function
- Requires management in a Neonatal Intensive Care Unit, consultation with a dermatologist and geneticist



Photo by Janelle Aby, MD
https://med.stanford.edu/newborns/professional-education/photo-gallery/skin.html#icthyosis

Case 3

- You are called to the bedside to evaluate an infant because there is a bluish color around the mouth and of the feet of the baby
- Baby is otherwise well, in no acute distress, breathing comfortably, there is no heart murmur
- The nurse tells you she conducted the Critical Congenital Heart Disease screening and pulse oximetry on right hand and right foot both 95%

Case 3



Photo by Janelle Aby, MD
https://med.stanford.edu/newborns/professional-education/photo-gallery/general.html#acrocyanosis

Case 3



Photo by Janelle Aby, MD
https://med.stanford.edu/newborns/professional-education/photo-gallery/general.html#perioral_cyanosis

Case 3: Acrocyanosis

- After birth, cyanosis of the feet, hands and perioral area are common
- Should improve over 24-48 hours
- Peri-oral cyanosis should be distinguished from true cyanosis as the tongue and mucous membranes in the mouth should be pink

Case 4

- Parents ask you to come to evaluate infant, they have noticed bruising and are concerned there was trauma from delivery

Case 4





Photo by Janelle Aby, MD
http://med.stanford.edu/newborns/professional-education/photo-gallery/skin.html#slate_grey_patchesmongolianspots

Case 4: Congenital Dermal Melanocytosis

- Blue-grey pigmented patches with ill-defined borders
- Most commonly occur in the sacral/gluteal region
- Can also occur on shoulders, extremities; rarely on face
- Completely benign, improve over time

Case 5

- Healthy, term infant born with lesions in different stages
- Parents are alarmed because skin appears to be infected

Case 5



Photo by Janelle Aby, MD
http://med.stanford.edu/newborns/professional-education/photo-gallery/skin.html#transient_neonatalpustularmelanosis

Case 5: Transient Neonatal Pustular Melanosis

- Benign condition
- Consists of 3 types of lesions
  - Small pustules on a non-erythematous base
  - Erythematous to hyperpigmented macules with a surrounding collarette of scale
  - Hyperpigmented macules that fade over weeks to months
- Lesions in different stages can be present at the same time, even at birth
- Lesions are filled with neutrophils, no bacteria



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Case 6

- Parents of an otherwise healthy 3-day old infant are concerned about a rash on baby's trunk, back, and legs
- Worried that they are bug bites

Case 6



Photo by Janelle Aby, MD
http://med.stanford.edu/newborns/professional-education/photo-gallery/skin.html#erythema_toxicum

Case 6: Erythema Toxicum Neonatorum

- Benign condition, very common
- Presents with multiple lesions, pustules over erythematous base
- Lesions may be present at birth but typically appear within 24-48 hours, and usually resolve by 5-7 days
- Changes rapidly, appearing and disappearing over several areas
- Wright-stained smear of the lesion reveals eosinophils and occasional neutrophils, not bacteria
- Hypothesized to be an immune response to the penetration of skin-colonizing flora into the hair follicle
- May have peripheral eosinophilia

Case 7

- 7-day old infant presents to your office with a rash, parents describe as blisters
- Infant currently doing well, no fever
- Pregnancy was uncomplicated, patient delivered vaginally, all prenatal labs were negative

Case 7



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Case 7: Neonatal Herpes Simplex Virus (HSV)

- Lesions usually develop at 6-13 days of life, infection usually occurs due to exposure during delivery; mother may be unaware of infection
- Can present as 1-3 mm vesicles and erythematous papules that may develop into pustules, crusts, and erosions
- If present in a newborn, requires emergent management in hospital setting: needs evaluation and treatment for possible disseminated HSV with central nervous system involvement



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Case 8

- Infant born at term gestation, no complications, all prenatal labs normal
- Parents are concerned about a lesion on the arm, worried infant was injured during delivery

Case 8



Photo by Janelle Aby, MD
http://med.stanford.edu/newborns/professional-education/photo-gallery/skin.html#sucking_blister

Case 8: Sucking blister

- Occurs from infant sucking on extremity while in womb
- At delivery can present as a blister or scabbed, healing area
- May observe infant sucking on the lesion post-natally

Case 9

- Parents are alarmed as they have noticed baby is missing hair from part of scalp

Case 9



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Case 9: Cutis Aplasia

- Congenital absence of skin
- May occur anywhere, most common on the scalp
- Differential diagnosis
  - Lesions from fetal scalp electrode (usually small, linear)
  - HSV (erosion often not present at birth)
- Can be benign, can be associated with other disorders i.e. Trisomy 13

Cutis Aplasia

- If singular, small, infant otherwise normal, likely does not need further workup
- If has a membrane and/or “hair collar sign” (ring of darker hairs around lesion) = evaluate for neural tube defects with imaging



Cutis aplasia with membrane

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Cutis Aplasia: Hair Collar Sign



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Case 10

- Parent have noticed redness on infant's forehead and are very concerned

Case 10



Photo by Janelle Aby, MD
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Case 10: Nevus Simplex

- Single or multiple blanchable, red-pink patches in newborns
- Common on eyelid, forehead, and neck
- Most commonly benign, fade over 1-2 years
- If occur in lumbosacral region in association with other abnormalities, evaluate for spinal dysraphism
- Differentiate from port-wine stains

Port Wine Stain

- AKA nevus flammeus
- Vascular malformations
- If in the ophthalmic and/or maxillary branch segments (V1/V2) of the trigeminal nerve, evaluate for Sturge Weber Syndrome with brain MRI and ophthalmologic examination



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Case 11

- Parents of a 3-week-old, otherwise health infant have noted a red bump on umbilicus, and there is mild drainage and smell

Case 11



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Case 11: Umbilical Granuloma

- Soft, moist, pink, usually pedunculated lesion
- Forms in the first few weeks of life, occurs from excess tissue after the cord has separated
- Can be treated with topical silver nitrate
- Differentiate from urachal abnormalities
  - Patent urachus: free communication between bladder and umbilicus, may have persistent, wet umbilicus and urinary tract infections
  - Umbilical polyps: firm masses, do not respond to silver nitrate, and require surgical excision

Umbilical Hernia

- Due to persistent fascial opening
- Most patients are asymptomatic and opening closes over time
- Rarely can lead to strangulation
- If large defect not improved by 4 years of age, or symptoms need surgical management



Photo by Janelle Aby, MD
http://med.stanford.edu/newborns/professional-education/photo-gallery/umbilical-cord.html#umbilical_herniar

Omphalitis

- Purulent discharge from umbilical stump with surrounding erythema, induration and tenderness
- Can lead to sepsis, death
- Medical emergency, must be treated with systemic antibiotics for polymicrobial infection



Photo by Janelle Aby, MD
http://med.stanford.edu/newborns/professional-education/photo-gallery/umbilical-cord.html#omphalitis

Case 12

- Parents have noticed a “hole” on infants back and are very concerned

Case 12: Sacral Dimple



Photo by Janelle Aby, MD
http://med.stanford.edu/newborns/professional-education/photo-gallery/back.html#sacral_dimple

Sacral Dimple

- Simple sacral dimples are most often benign if:
  - Are midline, overlying the coccyx
  - Have a visible intact base
  - Are <0.5 cm in diameter
  - Are <2.5 cm from the anal verge
- If sacral dimples are deep and large, are >2.5 cm above anal verge, or are associated with other changes on skin (such as hair tufts or discoloration), more likely to be associated with a neural tube defect and a spinal ultrasound should be done

Developmental Dysplasia of the Hip

- Risk factors = female sex, breech position, family history, incorrect swaddling
- **Ortolani maneuver:** dislocated hip is reduced into acetabulum with gentle hip abduction by examiner
  - Most important part of the exam
- **Barlow maneuver:** hip dislocated by posterior pressure, hip adduction
  - Recent AAP guidelines state that Barlow maneuver should not be done forcefully, if performed should be done by gently adducting hip while palpating for the femoral head falling out of acetabulum

- https://www.youtube.com/watch?v=Qy3uSkDhMZs

Galeazzi Sign

- Positive Galeazzi sign = unequal knee heights
- Suggest unilaterally dislocated hip



Photo by Janelle Aby, MD
http://med.stanford.edu/newborns/professional-education/photo-gallery/hips.html#galeazzi_sign

References

- Craiglow BG. Ichthyosis in the newborn. *Semin Perinatol*. 2013;37(1):26-31. doi:10.1053/j.semperi.2012.11.001. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3758581/pdf/nihms422161.pdf
- Section on Cardiology and Cardiac Surgery Executive Committee. Endorsement of health and human services recommendations for pulse oximetry screening and critical congenital heart disease. *Pediatrics* 2012;129;190; DOI:10.1542/peds.2011-3211
- Mathes, E and Howard, RM. Vesicular, pustular, and bullous lesions in the newborn and infant. In UpToDate, Levy ML, Edwards MS, and Corona R (Ed), UpToDate, Waltham, MA, 2020
- Tollefson MM. Aplasia Cutis Congenita. *Neoreviews* 2012;13:e285. DOI: 10.1542/neo.13-5-e285
- Palazzi DL, Brandt ML. Care of the umbilicus and management of umbilical disorders. In UpToDate, Duryea TK, Martin R, Kim MS (Ed). Waltham, MA, 2020
- MckEee TM. Assessment of the Newborn Infant. In UpToDate, Martin R, Duryea TK, and Kim MS (Ed), UpToDate, Waltham, MA, 2020
- Shaw BA, Segal LS and AAP Section on Orthopedics. Evaluation and Referral for Developmental Dysplasia of the Hip in Infants. *Pediatrics* 2016;138; DOI: 10.1542/peds.2016-3017
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