International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2025: 7.089

Delayed Subaponeurotic Fluid Accumulation in Early Infancy: A Clinical Case Report

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Abstract: ***Delayed subaponeurotic fluid accumulation is a rare, usually benign scalp condition observed in early infancy. This report describes a four-week-old infant who presented with a soft, painless scalp swelling that shifted in position and showed no signs of inflammation. Imaging identified a subcutaneous fluid collection without deeper involvement. The swelling resolved completely within three days with observation alone. This case adds to the limited literature, since only a few infants this young have been reported. The findings support the view that delayed subaponeurotic fluid accumulation should be included in the differential diagnosis of scalp swellings in young infants, and that conservative management is generally appropriate.***

Keywords: Delayed subaponeurotic fluid accumulation, subgaleal hematomas, infancy, scalp swelling, infant scalp swelling

Abbreviation: DSFC Delayed subaponeurotic fluid accumulation

1. Introduction

Delayed subaponeurotic fluid accumulation (DSFC) is a rare cause of scalp swelling that usually occurs in healthy, full-term infants during the second month of life. It is a benign condition that typically resolves spontaneously and usually requires only conservative management.

Subgaleal collections in children can originate from delayed subaponeurotic (subgaleal) fluid collection (DSFC) and subgaleal hematomas. In its classic form, DSFC appears a few weeks after a cephalic birth with instrumental assistance. It forms a soft, painless, skin-colored, noninflammatory subgaleal swelling. It usually resolves within a few weeks without complications.

Subgaleal hematomas are more frequent, can occur at any age, and are usually preceded by trauma.

In 2025, two infants aged 4 and 3 months, and a 13-year-old adolescent boy from the Dermatology Department of the French Groupe Hospitalier Public du Sud de l'Oise, were reported to have resolved without complications due to delayed subaponeurotic fluid accumulation (DSFC) (Brochet, 2025).

Riberio and colleagues reported two cases of DSFC: a 12-week-old boy and a six-week-old girl, both presenting with progressive, fluctuant scalp swelling without any history of trauma but only with a history of vacuum-assisted delivery. Conservative management was adopted in both cases, with complete resolution of the fluid collections within four weeks (Riberio, 2024).

A similar case was reported: a previously healthy 6-week-old male presented to the emergency department with new posterior scalp swelling (McCann, 2025).

The youngest infant was a 3-week-old girl reported by Hussein (2020). A 3-week-old girl was reported as seen with a 2-day history of scalp swelling. There was no history of trauma or scalp manipulation. There had been no noticeable change in the swelling's size or location since its discovery, and it subsided completely after 1 week.

In another reported case, a 10-month-old girl had a fluctuant, nontender scalp swelling with a visible fluid thrill on the posterior scalp (Armiento, 2015). It crossed the sagittal suture but was contained inferiorly by the lambdoid suture.

Five infants (4 males, 1 female, aged 5-14 weeks) who were diagnosed with DSCF at Ankara University Children' s Hospital were retrospectively reviewed for clinical findings, imaging studies, laboratory tests, management, and clinical courses (Ilarslan, 2019). All of these infants were delivered non-progressive (3 normal deliveries, 2 cesarean sections), while instrumentation (vacuum extraction or forceps) was used in 2. Conservative management with spontaneous resolution was observed in all infants within 2 to 12 weeks.

In a reported infant with a complicated cesarean delivery followed by a persistent, 4-cm effusion on the patient's posterior cranium, the swelling remained for 9 months (Howell, 2025).

Differential diagnostic considerations typically include caput succedaneum, cephalohematoma, subaponeurotic haemorrhage, and subgaleal CSF collection, but not seroma.

This report describes a rare presentation of delayed subaponeurotic fluid accumulation in a four-week-old infant and highlights key points for clinical recognition and management.

This case is noteworthy because very young infants with delayed subaponeurotic fluid accumulation are uncommon,

and early recognition can prevent unnecessary diagnostic procedures.

2. Case Presentation

The male born on January 5, 2026, is the second child of a healthy 33-year-old mother, whose first pregnancy was also a cesarean section. A few days ago, the baby was brought to the AnkaPedia Children's Health Center due to a swelling noticed on his head. The baby had previously undergone circumcision at the same center without any complications. Pre-circumcision bleeding tests were also found to be normal, and it was recorded that his umbilical cord fell off within a week, and there was no bleeding.

A 4-week-old child presented with a 10 cm diameter acquired swelling of the vertex for 1 day. His parents observed that the swelling seemed to shift in location, as shown in the picture. The swelling was soft, skin colored, painless, and did not cause discomfort on palpation. An ultrasound scan revealed no abnormalities except subcutaneous fluid swelling. The swelling regressed completely in 3 days.

Picture: A four-week-old infant with swelling under the scalp

Differential diagnosis of scalp swelling

Many diseases can be considered in the differential diagnosis. The patient's history, general condition, and clinical picture can help rule out many differential diagnoses. The following should be considered in the differential diagnosis (Medina, 2019):

1) Congenital lesions;

a) Dermoid and epidermoid cysts; Both lesions may overlap in imaging. Radiological features may vary depending on the content. On radiography, both dermoid and epidermoid cysts might appear as lucent lesions with well-defined sclerotic margins. MRI is not indicated unless there is a suspicion of intracranial extension or when the diagnosis is uncertain. On MRI, as a general rule, a cystic mass with lipid content that has no contact with intracranial structures suggests a dermoid cyst. Epidermoids typically, but not exclusively, show restricted diffusion on diffusion-weighted images. If the intracranial connection is seen, the diagnosis of an encephalocele should be considered.

b) Encephalocele; It is a herniation of intracranial tissue through a defect in the cranium, and it is often associated with other intracranial malformations

c) Vascular anomalies (vascular tumors and vascular malformations). Venous or mixed malformations are usually visualized on ultrasound or MRI.

d) Another congenital lesion that rarely appears as a palpable lump is the arachnoid cyst. It is a benign and asymptomatic lesion, usually located within the subarachnoid space, which contains CSF. The majority of arachnoid cysts are supratentorial. Imaging techniques can be helpful for diagnosis.

2) Benign lesions:

a) Lymph nodes; Lymph nodes constitute a common reason for ultrasound evaluation.

b) Langerhans cell histiocytosis

c) Other lesions: Pilomatricoma, subcutaneous granuloma annulare, myofibroma, angiomatoid fibrous histiocytoma are very rare.

3) Malignant lesions: Most of them are not recognized during the infant period.

a) Sarcomas

b) Osteosarcoma and Ewing sarcoma

c) Metastatic Lesions

4) Traumatic lesions; Most traumatic lesions occur during the neonatal period due to delivery.

a) Caput succedaneum

b) Subgaleatic hematoma

c) Cephalohaematoma

d) Ping-pong fracture

3. Discussion

The etiology of SFC is unknown. Moreover, there is a strong association with instrumental delivery by ventouse or forceps. A postulated mechanism is a subaponeurotic bleed at birth, initially masked by scalp swelling and moulding (Petraglia, 2010). This may subsequently cause the delayed swelling.

Although no link between gender and outcomes has been demonstrated, most reported cases involve male infants. This issue will become clearer as more cases are reported.

This condition is benign, and conservative management is recommended.

SFC is an important and benign entity for clinicians to recognize and manage appropriately, as no specific investigation or treatment is required. SFC is a benign condition that spontaneously resolves over time without intervention (Medows, 2014). Management is conservative, and resolution has been reported between 3 and 24 weeks, with an average of 3-4 weeks.

The exact etiology of SFC remains uncertain; however, certain distinctive characteristics are important for early recognition, ensuring that appropriate interventions are implemented if necessary.

Although the condition usually resolves spontaneously, each case should be reviewed carefully to confirm the diagnosis and ensure that abuse is not missed.

4. Conclusion

Delayed subaponeurotic fluid accumulation should be considered when infants present with soft, shifting scalp swellings that show no signs of trauma or inflammation. Early recognition can prevent unnecessary tests, since the condition resolves with simple observation. This case reinforces the benign nature of the condition and highlights the value of clinical awareness in distinguishing it from more serious causes of scalp swelling**.**

References

[1] Brochet T, Fleury S Jr, Poulain A Jr, Buchet S, Turc Y, Bourrat E and Eve Puzenat E (2025). Acquired subgaleal fluid collections in childhood: A case series JAAD Case Reports, 56; 99–103.
[2] Ribeiro IM, Sousa D, Rocha R, Carvalho C, Godinho C (2024). A Rare Cause of Scalp Swelling in Infants: Two Case Reports. Cureus.16: e75632. doi: 10.7759/cureus.75632
[3] McCann CP, Yamamoto K, Wang H (2025). Not All New Scalp Bulges Are Concerning. Pediatr Rev 46: 41–43. doi. org/10.1542/pir.2023-005994
[4] Hussain J, Chow A (2020). Spontaneous Subaponeurotic Fluid Collection. Consultant.60: 26-27
[5] Armiento R and Qi Fan W (2015). Scalp Swelling in a 10-Week-Old Infant. Ann Pediatr Child Health 3: 1079.
[6] Ilarslan AEC, Gunay F, Kaynak SS, Ucan B, Fitoz OS, Ince E (2019). A rare cause of scalp swelling in infancy: delayed subaponeurotic fluid collections in five cases. Child's Nerv Syst doi. org/10.1007/S00381-018-04040-9
[7] Howell JL, Pittman TJ, Coop C (2025). Delayed Subaponeurotic Fluid Collection in an Infant Without Trauma: A Literature Review and Case Report. Cureus 17: e88604. doi: 10.7759/cureus.88604
[8] Medina AA, González ERA, Quiles ABM, Busto JR, Chikri BMR, García MV (2019) doi. org/10.26044/ecr2019/C-3367
[9] Petraglia AL, Moravan M, Marky AH, Silberstein HJ (2010). Delayed sub-aponeurotic fluid collections in infancy: Three cases and a review of the literatüre. Surg Neurol Int 1; 34 doi: 10.4103/2152-7806.66622
[10] Medows M, Nijres BM (2014). Delayed subaponeurotic (subgaleal) fluid collection. BMJ Case Rep 2014; 2014: bcr2013203457, Doi: 10.1136/bcr-2013-203457