"BREAK THE SILENCE": A CASE STUDY OF AN AUTISTIC ADOLESCENT WITH SEVERE SPEECH DIFFICULTIES

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Abstract: Augmentative and Alternative Communication (AAC) provides an essential pathway for autistic individuals with limited speech to communicate effectively. Despite growing clinical use, detailed case-based evidence describing AAC intervention for autistic adolescents with severe apraxia of speech remains limited, particularly in Malaysian clinical contexts. This single-case study explored the assessment, intervention, and outcomes of a 13-year-old autistic boy who experienced communication regression following therapy interruption. A phased AAC intervention was delivered across 20 therapy sessions, supported by the Communication Matrix and the Family Impact of Assistive Technology Scale for AAC (FIATS-AAC). Baseline assessment placed the participant at Level IV (Unconventional Communication), characterised by reliance on simple gestures. The intervention incorporated naturalistic language learning, low-technology AAC using a picture communication board, and functional vocabulary. Following the intervention, the participant progressed to Level VI (Abstract Symbols), demonstrating increased symbolic communication and clearer expression of needs. Family-reported outcomes improved from 21.5 to 30.1, with notable gains in face-to-face communication, reduced frustration, and improved communication at home. These findings highlight AAC as a functional communication pathway and underscore the importance of individualised, family-supported AAC intervention for autistic adolescents with limited speech across home, educational, and community contexts.

Keywords: Autism; Augmentative and Alternative Communication (AAC); Case study; Childhood Apraxia of Speech; Family-centred intervention

1. Introduction

Autism spectrum disorder (ASD) is frequently associated with significant communication difficulties, particularly among individuals with limited or unreliable speech. Approximately 40% of autistic individuals do not develop functional spoken language sufficient for everyday communication (White et al., 2021). Childhood apraxia of speech may further compound these challenges by disrupting motor planning for speech production, resulting in severely reduced or absent speech in some individuals (Chilosi et al., 2022). CAS may appear in individuals with ASD with atypical phonological or speech patterns (Tierney, C. et al., 2016; Cabral, C. et al., 2021). For this population, augmentative and alternative communication (AAC) provides an essential pathway for expression, interaction, and participation in daily life.

AAC encompasses a range of unaided and aided strategies, including gestures, symbol-based systems, communication boards, and speech-generating devices. Evidence consistently demonstrates that AAC interventions improve socio-communicative behaviours and support participation among minimally speaking autistic individuals (Edgar et al., 2024; Elmquist et al., 2025). Although high-technology systems have gained increasing attention, low-technology AAC remains accessible, cost-effective, and foundational for early functional communication development (Jiang & Wang, 2026). Importantly, communication development is not always linear. Interruptions to therapy may result in reduced communicative attempts, increased reliance on non-symbolic behaviours, and heightened frustration. Although communication regression has been reported among autistic individuals, the process of communication recovery following regression remains under-documented in the literature (White et al., 2021; Pope et al., 2024).

Within Malaysia, AAC services continue to expand but remain unevenly distributed. Existing local research has primarily focused on parental perceptions and usability of AAC tools rather than detailed intervention processes and functional communication outcomes (Singh et al., 2023; Rajagopal et al., 2024). As a result, there is limited case-based evidence describing how AAC interventions unfold over

time in home and therapy contexts for autistic adolescents with severe speech and motor-planning difficulties.

This case study documents the assessment, intervention, and outcomes of a 13-year-old autistic boy with severe apraxia of speech who experienced communication regression following therapy interruption. This study aims to explore the implementation of a phased augmentative and alternative communication (AAC) intervention, progressing from unaided communication to a low-technology picture communication board, in supporting functional communication and family participation in everyday routines.

2. Literature Review

2.1 *AAC for Autistic Individuals with Limited Speech*

Augmentative and Alternative Communication (AAC) is an established evidence-based intervention for autistic individuals with limited or unreliable speech. Research shows that AAC expands communicative functions beyond basic requesting, enhances social interaction, and supports participation across contexts (Schlosser & Koul, 2023; Chavers Edgar et al., 2024). Significantly, AAC use does not hinder speech development and may occur alongside gains in spoken language (White et al., 2021). Integrating AAC within naturalistic developmental and behavioural interventions has also been associated with improved language outcomes for minimally speaking autistic children (Pope et al., 2024).

For individuals with childhood apraxia of speech, the motor demands of speech production can significantly limit opportunities for meaningful communication. Symbol-based AAC systems provide an alternative pathway by enabling expression without reliance on precise articulation. Studies involving minimally verbal autistic individuals indicate that AAC supports the emergence of functional communication and early semantic development despite unreliable speech (Chavers Edgar et al., 2024; Therrien et al., 2025). Access to a stable AAC system is crucial following communication regression, as it provides a consistent means to maintain and rebuild functional communication (Pope et al., 2024).

Recent empirical studies have also demonstrated the effectiveness of AAC interventions for older children and adolescents with autism, particularly when combined with caregiver-mediated approaches. For example, studies have reported increased communicative initiations, improved functional communication, and better generalisation when AAC is implemented across home and therapy contexts (Elmquist et al., 2025; Therrien et al., 2025). For instance, Brady et al. (2021) AAC systematic review autism reported that AAC interventions were associated with significant improvements in communicative initiation and functional communication across age groups, including school-aged individuals and including aided language input and multimodal communication approaches. These findings highlight the importance of sustained, contextually embedded AAC intervention beyond early childhood.

2.2 *Family-Centred AAC and the Malaysian Context*

Family involvement plays a central role in successful AAC implementation. When caregivers model AAC and integrate it into daily routines, communication gains are more likely to generalise beyond therapy settings (Muttiah et al., 2022). Caregiver-implemented AAC interventions have been linked to improved communication outcomes and increased participation in natural environments (Elmquist et al., 2025).

In Malaysia, AAC research is growing but remains limited. Local studies highlight positive parental perceptions of AAC alongside ongoing challenges related to training, access, and service availability (Singh et al., 2023). Other research has examined the usability of AAC tools without documenting detailed intervention processes or communication outcomes (Rajagopal et al., 2024).

Similarly, O'Neill et al. (2020) demonstrated that parent-mediated AAC interventions for autism led to increased communication frequency and generalisation in home settings, highlighting the importance of caregiver involvement in sustaining communication gains. Thus, there is a need for detailed case-based evidence describing how AAC interventions are implemented and sustained within real family environments.

3. Methodology

3.1 *Study Design and Participant*

This study was conducted as a practice-based clinical case study describing the implementation and outcomes of a phased augmentative and alternative communication (AAC) intervention. A case study approach was chosen because the participant showed clear communication regression after a long break from therapy and required an individualised, family-centred intervention embedded in daily routines.

The participant was a 13-year-old autistic boy with severe speech difficulties and very limited communicative attempts before intervention. Therapy sessions were delivered in a speech-language therapy setting approximately three to four times per month. Each session lasted 30 minutes and was followed by 10–15 minutes of caregiver coaching. Behaviour during sessions was manageable based on clinical observation and consultation with the participant's occupational therapist.

3.2 *Baseline Assessment and Vocabulary Selection*

Baseline assessment included the Communication Matrix and the Family Impact of Assistive Technology Scale for AAC (FIATS-AAC), together with a structured review of daily routines and communication needs. These findings guided goal setting and vocabulary selection (refer to Table 1).

Vocabulary was selected through a structured process combining Communication Matrix results, relevance to daily routines, and existing research supporting the use of core vocabulary in AAC (Beukelman & Light, 2020). The final vocabulary list was used consistently in therapy and home practice to support repeated exposure and generalisation.

Functional vocabulary selection prioritised a balance of core and fringe words. Core vocabulary consists of high-frequency words that can be used across multiple communicative functions and contexts, and teaching a small set of functional words (e.g., *want, go, more, stop, help*) supports early multi-symbol communication and generative language use (Beukelman & Light, 2020; Light & McNaughton, 2012). However, core vocabulary alone may not capture all conceptually important and personally relevant words, underscoring the need for individualised, contextually meaningful vocabulary (Cooper & Soto, 2024). Fringe vocabulary related to daily activities and personal interests was therefore incorporated to support functional communication. The intervention consistently targeted the same set of words across therapy sessions and home routines to promote generalisation.

Table 1: Vocabulary Selection

Step	Source	Purpose	Outcome
1	Core vocabulary research (Banajee et al., 2003; Beukelman & Light, 2020)	Identify high-frequency functional words	Initial vocabulary pool
2	Communication Matrix results	Identify communication level and needs	Vocabulary for requesting, commenting, responding
3	Review of daily routines	Ensure relevance to home contexts	Contextually meaningful vocabulary
4	Functional use across contexts	Ensure cross-situational use	Refined vocabulary list

5	Final selection of vocabulary used	Consistent therapy and home use	Target vocabulary for intervention

The Communication Matrix is a widely used assessment tool that describes early communication development across seven levels, ranging from pre-intentional behaviour (Level I) to language use (Level VII). In this study, Level IV (Unconventional Communication) reflects intentional but non-symbolic communication such as gestures and body movements. In contrast, Level VI (Abstract Symbols) represents the use of symbolic communication, including pictures or words, to convey meaning. This framework was used to interpret changes in communicative function and symbolic development across the intervention.

3.3 *Intervention Procedures*

The intervention followed a phased clinical approach delivered across 20 sessions, with each session lasting approximately 30–35 minutes. An additional 10 minutes was allocated at the end of each session for caregiver briefing and home-based programme (HBP) guidance. Sessions were conducted twice per month. The summary of phased AAC sessions is shown in Table 2.

Table 2: AAC Intervention Phase

Phase	*Key Components*
Baseline	Communication Matrix, FIATS-AAC, identification of communication regression; review of daily routines and communication needs.
Phase 1 (Sessions 1–10)	Unaided AAC intervention: gesture-based communication, development of communicative intent, increased communicative participation, introduction of parent training.
Phase 2 (Sessions 11–20)	Aided AAC implementation using a picture communication board: introduction of low-technology AAC, vocabulary use, aided language input, home-based practice, family training and routine integration.
Post-Intervention	Communication Matrix, FIATS-AAC, review of session observations.

a) Phase 1: Unaided AAC (Sessions 1–10)
The first phase focused on establishing communicative intent using unaided AAC strategies. Therapy emphasised gesture use, structured communication opportunities, and participation in play and daily routines. Parent coaching began during this phase to support early carryover at home.

b) Phase 2: Aided AAC (Sessions 11–20)
The second phase introduced a low-technology picture communication board using the selected vocabulary. Aided Language Input (ALI) was the main teaching strategy. The therapist modelled symbol use while speaking to support symbols–meaning mapping and early language development (Beukelman & Light, 2020; Ganz et al., 2022).

Recasting was used to expand communicative attempts by modelling slightly more complete versions of the participant's message. For example, when the participant gestured to request an item, the therapist modelled the symbols *want* + *snack* while verbally expanding the request. Because the participant showed strong interest in passive mobile device use (i.e Youtube), caregivers preferred unaided and low-technology AAC rather than speech-generating devices at this stage.

3.4 *Caregiver Training and Home Practice*

Caregiver training was integrated throughout the intervention. Caregivers were coached to model AAC during daily routines, create structured communication opportunities and practise the same vocabulary at home.

Written home-based practice (HBP) guidelines were provided after each session, and progress was documented in an online case record. Caregivers could contact the therapist via email for clarification, and sessions were rescheduled when health-related interruptions occurred. Generalisation was

supported by using vocabulary across multiple contexts (e.g., play, outdoor activities, transitions) and by using a planned pause ("communication sabotage") technique to create natural communication opportunities (Light & McNaughton, 2012).

3.5 *Outcome Monitoring and Mastery Criteria*

Intervention progress was monitored using session-based performance data alongside standardised and observational outcome measures. A communication opportunity was defined as any naturally occurring or therapist-created situation in which the participant could use AAC to express communicative intent. Successful use was defined as accurate symbol selection representing a meaningful communicative message, independently or with minimal prompting. Progress was reviewed continuously based on functional communication performance and relevance to daily routines, consistent with recommendations that AAC intervention should remain responsive to individual progress (Light & McNaughton, 2012; Chazin et al., 2021).

To capture broader communication outcomes, changes were evaluated using pre- and post-intervention Communication Matrix and FIATS-AAC scores. These measures were used to examine changes in symbolic communication, communicative participation, and family-reported communication impact.

Session observations and caregiver notes were used to document communicative initiations, responses to communication partners, and AAC use across daily routines. Home practice focused on generalisation within at least two routines, with caregivers recording brief notes on communication attempts to support ongoing monitoring of AAC use beyond therapy sessions.

3.6 *Intervention Fidelity and Data Analysis*

Intervention fidelity was supported through the use of a structured session protocol outlining procedures, teaching strategies, and caregiver involvement. All sessions were delivered by the same speech-language therapist and followed a consistent format that included review of home practice, structured AAC activities, caregiver coaching, and provision of written home-based practice guidelines.

Performance data were recorded during each session using structured data sheets documenting communication opportunities and successful AAC use. In addition to descriptive analysis, session-by-session trends were examined to identify patterns of change in communicative performance across the intervention period. A visual graph was constructed to illustrate the increase in successful AAC use across sessions, highlighting differences between Phase 1 (unaided AAC) and Phase 2 (aided AAC). This visual representation supports interpretation of learning progression rather than relying solely on summary outcomes.

3.7 Ethical Considerations

This case study was conducted as part of routine clinical service delivery. Caregivers provided written agreement for the child's participation in therapy and documentation of therapy progress in the clinical case record. Retrospective permission to use anonymised clinical data for research and publication was obtained from the caregivers. All identifying information was removed to ensure confidentiality. Participation was voluntary, and caregivers were informed of their right to withdraw at any time without affecting ongoing clinical services.

4. Results

4.1 *Pre–Post Standardised Outcomes*

Clear improvements in communication were observed following the AAC intervention. Communication Matrix results indicated a shift from Level IV (Unconventional Communication) at baseline to Level VI (Abstract Symbols) post-intervention. At baseline, communication relied primarily

on gestures and facial expressions. After the intervention, the participant demonstrated increased use of symbolic communication to express needs and respond to communication partners, indicating improved communicative participation.

Family-reported outcomes also showed improvement. FIATS-AAC scores increased from 21.5 pre-intervention to 30.1 post-intervention, suggesting a greater perceived functional impact of AAC use within the home environment. Although scores remained within the lower range of the total scale (13–91), the increase indicates meaningful early progress and highlights the continued need for AAC to consolidate gains, support generalisation, and reduce the risk of communication regression.

4.2 *Caregiver and Clinical Observations*

Caregivers reported increased face-to-face interaction, reduced reliance on guessing the participant's needs, and greater confidence in interpreting his messages. Session observations aligned with these reports, showing more frequent communicative initiations, increased use of AAC to express needs, and more consistent responses to communication partners. Communication became increasingly intentional and less dependent on non-symbolic behaviours over time.

4.3 *Clinical Interpretation of Communication Change*

Communication Matrix results indicated a shift from Level IV (Unconventional Communication) at baseline to Level VI (Abstract Symbols) post-intervention. At Level IV, the participant's communication was intentional but primarily non-symbolic, relying on gestures, body movements, and facial expressions without consistent use of shared meaning. In contrast, Level VI reflects the use of abstract symbols such as pictures or words to convey meaning intentionally.

This progression indicates a transition from pre-symbolic communication to early symbolic communication, representing a clinically meaningful improvement in the participant's ability to express needs, respond to others, and participate in functional communication exchanges.

The improvement in FIATS-AAC scores further suggests that communication gains extended beyond therapy sessions into everyday family interactions. Together, these findings indicate early generalisation of AAC use within natural home environments, an important indicator of intervention relevance and functional impact. A summary of pre- and post-intervention outcomes is presented in Table 3.

Table 3: Summary of Pre- and Post-Intervention Outcomes

Measure	Pre-Intervention	Post-Intervention	Change / Interpretation
Communication Matrix	Level IV	Level VI	Increased symbolic communication.
FIATS-AAC (Family-related)	21.5	30.1	Increased perceived functional impact on family communication.
Communicative Participation	Limited initiation	Increased initiation and response	Greater participation.

These findings suggest that the observed improvements were not only developmental but also intervention-related, particularly linked to the introduction of aided AAC and consistent caregiver involvement. The shift in communication patterns indicates that access to visual-symbolic support may have reduced cognitive and motor demands associated with speech production, enabling more efficient message construction. This supports the role of AAC as a compensatory as well as developmental communication system.

4.4 Session-Based Progress Across Intervention

A visual analysis of session data showed a gradual increase in successful communicative attempts across the 20 sessions (see Figure 1). During Phase 1 (Sessions 1–10), progress was variable, reflecting the early development of communicative intent using unaided strategies such as gestures. For example, responses increased from 1–2 successful attempts in the initial sessions to approximately 4–5 attempts by Session 10, although fluctuations were observed (e.g., a slight decrease around Sessions 5 and 8). This variability is consistent with the learning demands associated with establishing intentional communication without external symbolic support.

Clinically, the participant relied on a limited set of gestures to express basic needs, such as "eat," "sleep," and "hungry." Food-related communication was restricted to familiar items, such as fried chicken and burgers, expressed through gestures. While these attempts demonstrated emerging communicative intent, the range and consistency of communication remained limited, which corresponds with the variability observed in Phase 1 of Figure 1.

In contrast, a clearer and more consistent upward trend was observed in Phase 2 (Sessions 11–20), following the introduction of the picture communication board. Successful AAC responses increased steadily from approximately 5–6 responses in Session 11 to 10 responses by Sessions 19–20, with minimal variability compared to Phase 1. Following this transition, the participant began to use visual symbols to communicate a wider range of messages, including identifying family members and making choices between different food items. This shift from gesture-based to symbol-based communication enabled more precise and consistent expression, aligning with the steady improvement observed in Figure 1.

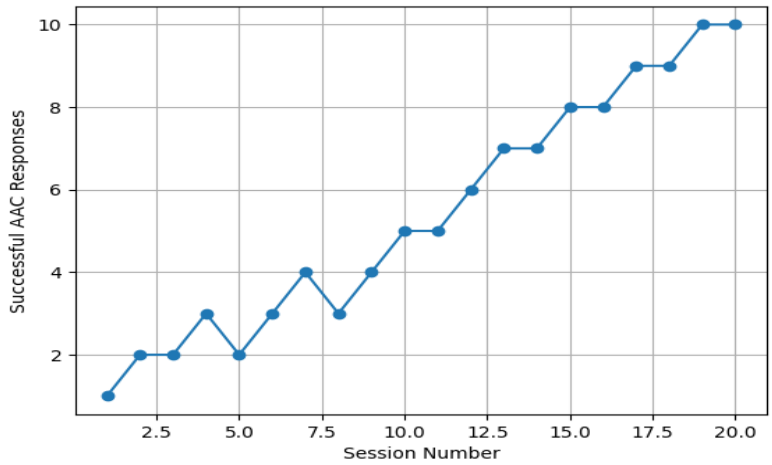


Figure 1: Number/percentage of successful AAC responses across sessions

Overall, this pattern suggests that while unaided AAC supported foundational communicative intent, aided AAC facilitated more stable and functional symbolic communication. The participant demonstrated an increase in the number of functional vocabulary items used, expanding from a limited set of gestures in Phase 1 to a broader range of symbolic representations using the communication board in Phase 2.

5. Discussion

This case study examined the impact of a phased AAC intervention for an autistic adolescent with severe speech difficulties following communication regression. Improvements may reflect the effects of repeated aided language exposure and distributed practice across therapy and home environments, which support the development of symbolic communication (Light & McNaughton, 2012; Ganz et al., 2022; Pope et al., 2024).

5.1 *Communication Development and Symbol Use*

The progression from Communication Matrix Level IV (unconventional communication) to Level VI (abstract symbols) reflects a clear shift toward intentional symbolic communication and increased participation. At the earlier stage, communication was limited to unconventional, non-symbolic behaviours that required interpretation by caregivers. Following the intervention, the participant demonstrated the ability to use symbolic representations (e.g., pictures) to communicate meaning more clearly and consistently. This transition is significant because symbolic communication enables more flexible, generalisable, and independent expression across contexts, while reducing reliance on communication partners to interpret intent. As a result, communication becomes more effective and functional in everyday environments.

This finding aligns with evidence that AAC supports the transition from non-symbolic to symbolic communication (Beukelman & Light, 2020; Romski & Sevcik, 2005) and may enhance language outcomes when integrated with naturalistic intervention approaches (Pope et al., 2024). These developmental stages provide a useful framework for interpreting the participant's progress, allowing changes to be understood not merely as score differences but as meaningful gains in communicative competence. In addition, the selected vocabulary supported flexible and generative communication across contexts (Beukelman & Light, 2020), while increased communicative initiations and functional message expression indicate growing communicative intent and readiness for further vocabulary expansion.

5.2 *Importance of Phased AAC Implementation*

The phased introduction of AAC began with unaided strategies and progressed to aided AAC, which likely supported engagement while reducing learning demands. This is in line with previous findings that emphasise the importance of building intentional communication prior to introducing symbolic AAC systems (Beukelman & Light, 2020; Romski et al., 2015). Establishing communicative intent during the initial phase facilitated the transition to symbolic communication during the aided phase. Similar patterns have been reported in caregiver-mediated low-technology AAC interventions, demonstrating increased spontaneous communication following training (Jiang & Wang, 2026).

5.3 *Family Impact and Communication Participation*

Improvements in FIATS-AAC scores suggest a positive impact on family communication, including reduced reliance on guessing and greater confidence in interpreting messages. These findings are consistent with research showing that caregiver involvement supports communication generalisation and participation across natural environments (Elmquist et al., 2025; Muttiah et al., 2022; Semmler et al., 2025). The integration of caregiver coaching and home-based practice likely contributed to the observed early generalisation of AAC use beyond therapy sessions.

5.4 *Policy Act*

From a broader perspective, these findings align with Malaysia's ongoing efforts to promote inclusive education and support individuals with disabilities under policies such as the Persons with Disabilities Act 2008 and the expansion of inclusive education programmes in mainstream schools. AAC intervention can play a critical role in enabling participation of students with communication difficulties within inclusive classroom settings by providing accessible means of expression. This case highlights the need for increased AAC awareness, training, and service provision within educational and healthcare systems to support national inclusion goals.

6. Limitations and Future Directions

This study is limited by its single-case design, which restricts the generalisability of the findings, and the absence of a comparison condition, which limits the ability to establish causal relationships between the intervention and observed outcomes. In addition, the relatively short intervention period and lack of long-term follow-up preclude evaluation of the maintenance of communication gains over time. Furthermore, the outcome measures focused primarily on functional communication and may not fully capture broader aspects of communicative competence; the inclusion of additional AAC-related measures, such as pragmatic profiles, would allow for a more comprehensive evaluation of social communication and interaction.

Future research should involve larger sample sizes and more robust study designs, including comparative or controlled studies, to strengthen the evidence base for AAC intervention. Longitudinal investigations are also needed to examine the maintenance of communication gains and long-term AAC use across contexts. In addition, future work should explore the integration of AAC interventions within school settings and investigate scalable, caregiver-mediated training models to support sustained implementation, alongside the use of comprehensive outcome measures, including pragmatic and participation-based assessments, to better capture real-world communication outcomes.

7. Conclusion

These findings highlight the clinical value of a phased, family-centred AAC intervention in supporting functional communication recovery and enhancing participation in everyday routines. The study underscores the importance of contextually embedded and caregiver-supported approaches in promoting meaningful communication outcomes.

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